N-TRON
THE INDUSTRIAL NETWORK COMPANY

NT24k Managed Industrial Ethernet Switch

User Manual & Installation Guide

(Revised 4-9-2013)

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NT24k Industrial Ethernet Switch Installation Guide

The NT24k is available in three configurations and this document addresses all three:

NT24k Rack Mount:

NT24k-DR24:

NT24k-DR16:

NT24k Series Common Features

The NT24k are modular managed switches designed for factory automation, utilities, security surveillance, SCADA and other industrial applications.

The versatile N-Tron® NT24k Managed Industrial Ethernet Switches feature connectivity for up to 24 Gigabit (16 for the NT24k-DR16) ports and offer a wide range of connectivity options—including 100Base, Gigabit, fiber optic and copper options—in rugged Rack Mount or DIN-rail enclosures. Designed to handle the most demanding environments, the NT24k Switches deliver wire-speed throughput and include expanded shock and vibration tolerances, extreme operating temperature range and two or three slots to accommodate mix-and-match port modules. N-Ring™ technology restores network communication within ~30ms of fault detection. Robust remote monitoring capabilities make management easy.

APPLICATIONS

> Factory Automation
> Utilities
> SCADA
> Security Surveillance
> Transportation
> Alternative Energy

PRODUCT HIGHLIGHTS

> All Gigabit Modular Design
> Up to 24 Port Connections
> High Environmental Specifications
> N-Ring Advanced Ring Technology
> Robust Remote Monitoring
> Smart Plug-and-Play Operation

FEATURES & BENEFITS

> Supports up to three of the following port modules:
  - 8-port 10/100/1000BaseT(X) module
  - 8-port 100Base fiber module
  - 8-port 1000Base fiber module
  - 8-port Gigabit SFP module
  - 8-port dual mode SFP module (100Base or 1000Base SFP transceivers)
> Power input selections:
  - Low Voltage: 18-49 VDC
  - High Voltage: 90-264 VAC or 90-300 VDC
> Onboard temperature sensor
> ESD and surge protection diodes on all copper ports
> Auto-sensing 10/100/1000BaseT(X), duplex and MDIX
> USB configuration port
> Configurable alarm contact
> Optional backup/restore configuration device
> Fully managed features include:
  - Jumbo frame support
  - SNMP v1, v2, v3
  - Web browser management
  - Detailed ring map and fault location charting
  - RSTP - 802.1d, 802.1w, 802.1D
  - IGMP auto-configuration
  - Trunking and port mirroring
  - 802.1Q tag VLAN and port VLAN
  - 802.1p QoS, port QoS and DSCP
  - DHCP client
  - N-Ring technology with ~30ms healing
  - N-View™ OPC monitoring

NT24k Series Common Features, Continued …

SWITCH PROPERTIES

Number of MAC Addresses: 16K
Aging Time: Programmable
Latency (typical): 1.6 µs
Switching Method: Store & Forward

SHOCK AND VIBRATION (BULKHEAD MOUNTED)

Shock: 50g @ 10ms
Vibration/Seismic: 30g, 10-200 Hz, triaxial

RELIABILITY

MTBF: >1 million hours

NETWORK MEDIA

10BaseT: ≥Cat3 cable
100BaseTX: ≥Cat5 cable
1000BaseT: ≥Cat5 cable
100BaseFX, 1000BaseSX Multimode: 50-62.5/125µm
100BaseFXE, 1000BaseLX Singlemode: 7-10/125µm

RECOMMENDED WIRING CLEARANCE

Front and Top: 4" (10.2 cm)

REGULATORY

Product Safety:
- Class I, Division 2, Groups A, B, C and D hazardous locations
- UL508
- ANSI/ISA 12.12.01-2011
- CAN/CSA-C22.2 No. 14-01
- CAN/CSA-C22.2 No. 213-M1987

Emissions: FCC Title 47, Part 15, Radio Frequency Devices, Subpart B
- ANSI C63.4-2009; Industry Canada ICES-003
- EN 55011; EN 61000-6-4 (radiated and conducted)

Immunity: EN 61000-3-2; EN61000-3-3; EN 61000-6-2; IEC 61000-4-2 (ESD); IEC 61000-4-3 (RFAM); IEC 61000-4-4 (EFT); IEC 61000-4-5 (SURGE); IEC 61000-4-6 (RFCM); IEC 61000-4-8 (PFMF); IEC 61000-4-11 (VDI)

Other: EMC Directive 2004/108/EC; GOST-R

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NT24k Series Common Features, Continued …

PORT MODULES & TRANSCEIVERS	
NT24K-TX8	8-port 10/100/1000BaseT module
NT24K-FX8-XX	Slide-in module with 8 100BaseFX multimode fiber ports, 2km (SC or ST)
NT24K-FXE8-XX-YY	Slide-in module with 8 100BaseFX singlemode fiber ports (SC or ST)
NT24K-GX8-SC	Slide-in module with 8 1000BaseFX multimode fiber ports, 550m (SC)
NT24K-GXE8-SC-ZZ	Slide-in module with 8 1000BaseFX singlemode fiber ports (SC)
NT24K-SFP8	Slide-in module with 8 SFP expansion slots; supports 1000Base SFP transceivers*
NT24K-SFP-DM8	Slide-in module with 8 dual mode SFP expansion slots; supports 100Base or 1000Base SFP transceivers*
NTSFP-FX	100BaseFX multimode fiber SFP pluggable mini-GBIC transceiver (LC style connector, 2km)**
NTSFP-FXE-YY	100BaseFX singlemode fiber SFP pluggable mini-GBIC transceiver (LC style connector)**
NTSFP-TX	1000BaseT copper SFP pluggable mini-GBIC transceiver
NTSFP-SX	1000BaseSX multimode fiber SFP pluggable mini-GBIC transceiver
NTSFP-LX-ZZ	1000BaseLX singlemode fiber SFP pluggable mini-GBIC transceiver

Where: XX = ST or SC connector (ST not available on some GX modules); YY = 15, 40, or 80 for FX singlemode, blank for multimode; ZZ = 10, 40, or 80 for GX singlemode. *SFP transceivers sold separately. **For use with SFP DM8 module only

NT24k Rack Mount

The N-Tron® NT24k Rack Mounted Managed Industrial Ethernet Switch features connectivity for up to 24 Gigabit ports in a rugged 1U 19” rackmount enclosure. Designed to handle the most demanding environments, the NT24k includes dual power inputs, extreme operating temperature range and three slots to accommodate mix-and-match port modules.

POWER INPUT

Input Voltages:
- Low Voltage: 18-49 VDC
- High Voltage: 90-264 VAC or 90-300 VDC

Input Current (max): 2.26A @ 24VDC
Input Current (max): 790mA @120 VAC/450mA @ 124VDC
BTU/hr: 185 @ 24VDC
BTU/hr: 365 @ 120VAC/190 @ 124VDC

CONNECTORS

10/100/1000BaseT(X): Up to 24 RJ45 copper ports
100BaseFX: Up to 24 SC or ST fiber ports
1000BaseGX: Up to 24 SC fiber ports
100BaseSX/LX SFP: Up to 24 LC fiber ports
1000BaseGX SFP: Up to 24 LC fiber ports

ENVIRONMENTAL

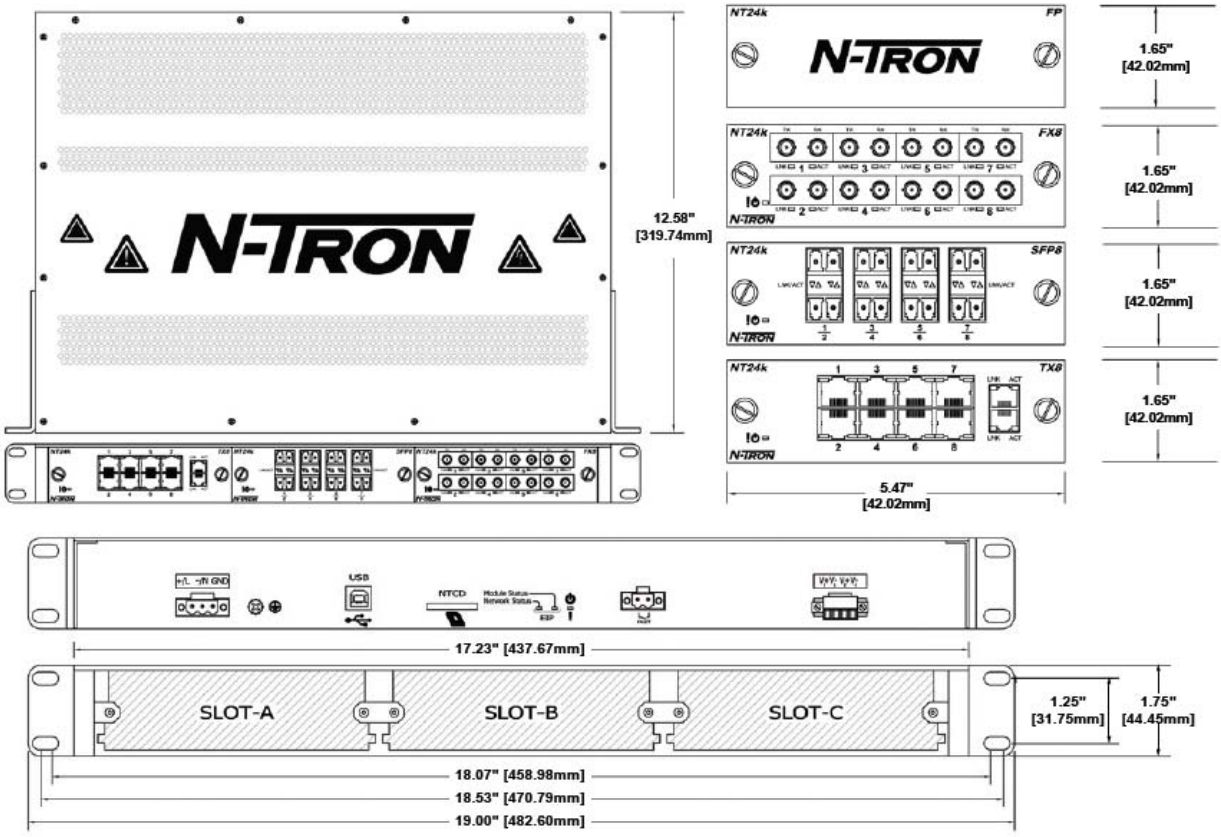
Operating Temperature: -40° C to 85° C
Operating Humidity: 5% to 100% (Non Condensing)
Operating Altitude: 0 to 10,000 ft.

MECHANICAL

Case Dimensions
Height: 1.9” (4.8 cm)
Width: 17.5” (44.5 cm)
Depth: 12.7” (32.0 cm)
Weight (maximum): 12.85 lbs (5.83 kg)
Mount: Rackmount 1U

NT24k Rack Mount, Continued …

DIMENSIONS



All specifications are subject to change. Consult the company website for more information.

ORDERING GUIDE

PART NUMBER	DESCRIPTION
NT24K-DC1	1U rackmount 3-slot modular Gigabit switch with one redundant 18-49 VDC power input
NT24K-DC2	1U rackmount 3-slot modular Gigabit switch with two redundant 18-49 VDC power inputs
NT24K-AC1	1U rackmount 3-slot modular Gigabit switch with one 90-264 VAC/90-300 VDC power input
NT24K-AC2	1U rackmount 3-slot modular Gigabit switch with two 90-264 VAC/90-300 VDC power input
NT24K-AC1-DC1	1U rackmount 3-slot modular Gigabit switch with one each 90-264 VAC/90-300 VDC and 18-49 VDC power inputs
NT24K-FP	Filler panel (required to fill vacant module slots)
NT24-PMK	Panel mount kit
NTCD-CFG	Configuration recovery device
NTPC-AC-US	AC power cord
NTPS-24-3	DIN rail power supply 3.0 Amp@24 VDC

NT24k-DR24

The NT24k-DR24 Managed Industrial Ethernet Switch features connectivity for up to 24 Gigabit ports in a rugged DIN-rail enclosure.

POWER INPUT OPTIONS

Select one:
- Low Voltage: 18-49 VDC
- High Voltage: 90-264 VAC or 90-300 VDC

Input Current (max): 2.14A @ 24VDC
Input Current (max): 780mA @120 VAC/430mA @ 124VDC
BTU/hr: 175 @ 24VDC
BTU/hr: 360 @ 120VAC/182 @ 124VDC

CONNECTORS

10/100/1000BaseT(X): Up to 24 RJ45 copper ports
100BaseFX: Up to 24 SC or ST fiber ports
1000BaseGX: Up to 24 SC fiber ports
100BaseSX/LX SFP: Up to 24 LC fiber ports
1000BaseGX SFP: Up to 24 LC fiber ports

ENVIRONMENTAL

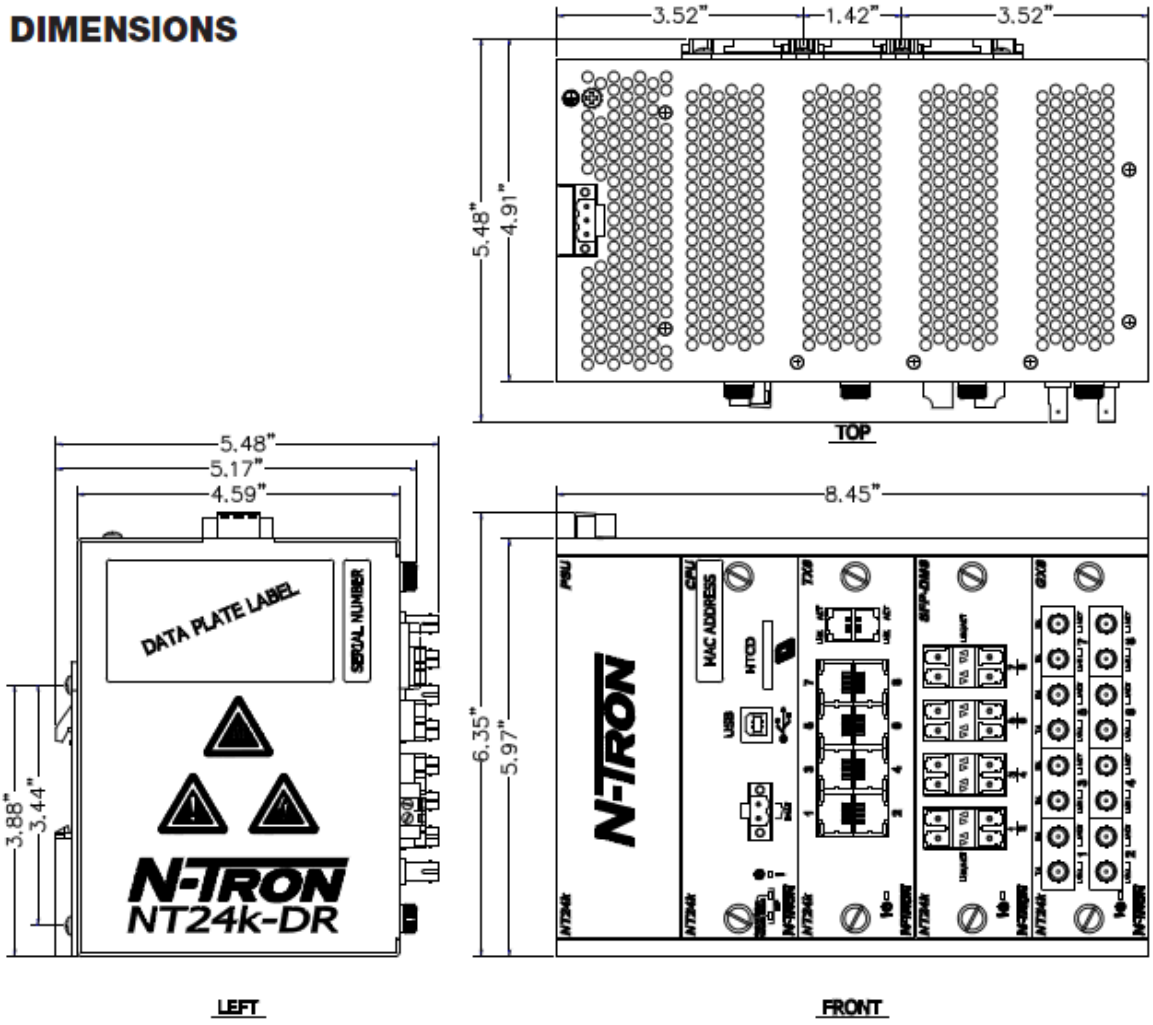
Operating Temperature: -40˚ C to 75˚ C
Operating Humidity: 5% to 100% (Non Condensing)
Operating Altitude: 0 to 10,000 ft.

MECHANICAL

Case Dimensions
Height: 5.97" (15.20 cm)
Width: 8.45" (21.46 cm)
Depth: 4.59" (11.65 cm)
Weight (maximum): 7.8 lbs (3.54 kg)
Mount: DIN rail

NT24k-DR24,Continued…

DIMENSIONS



All specifications are subject to change. Consult the company website for more information.

ORDERING GUIDE

PART NUMBER	DESCRIPTION
NT24K-DR24-DC	Managed Industrial Ethernet Switch; modular DIN rail design with 3 expansion slots; redundant 18-49VDC power input
NT24K-DR24-AC	Managed Industrial Ethernet Switch; modular DIN rail design with 3 expansion slots; 90-264VAC / 90-300VDC power inputs
NT24K-FP	Filler panel (required to fill vacant module slots)
NTCD-CFG	Configuration recovery device
NTPC-AC-US	AC power cord
NTPS-24-3	DIN rail power supply 3.0 Amp@24 VDC
NT24K-DR-PMK	NT24k DR panel mount kit

NT24k-DR16

The N-Tron® NT24k-DR16 Managed Industrial Ethernet Switch features connectivity for up to 16 Gigabit ports in a rugged DIN rail enclosure.

POWER INPUT OPTIONS

Select one:
- Low Voltage: 18-49 VDC
- High Voltage: 90-264 VAC or 90-300 VDC

Input Current (max): 1.52A @ 24VDC
Input Current (max): 580mA @120 VAC/300mA @ 124VDC
BTU/hr: 125 @ 24VDC
BTU/hr: 268 @ 120VAC/127 @ 124VDC

CONNECTORS

10/100/1000BaseT(X): Up to 16 RJ45 copper ports
100BaseFX: Up to 16 SC or ST fiber ports
1000BaseGX: Up to 16 SC fiber ports
100BaseSX/LX SFP: Up to 16 LC fiber ports
1000BaseGX SFP: Up to 16 LC fiber ports

ENVIRONMENTAL

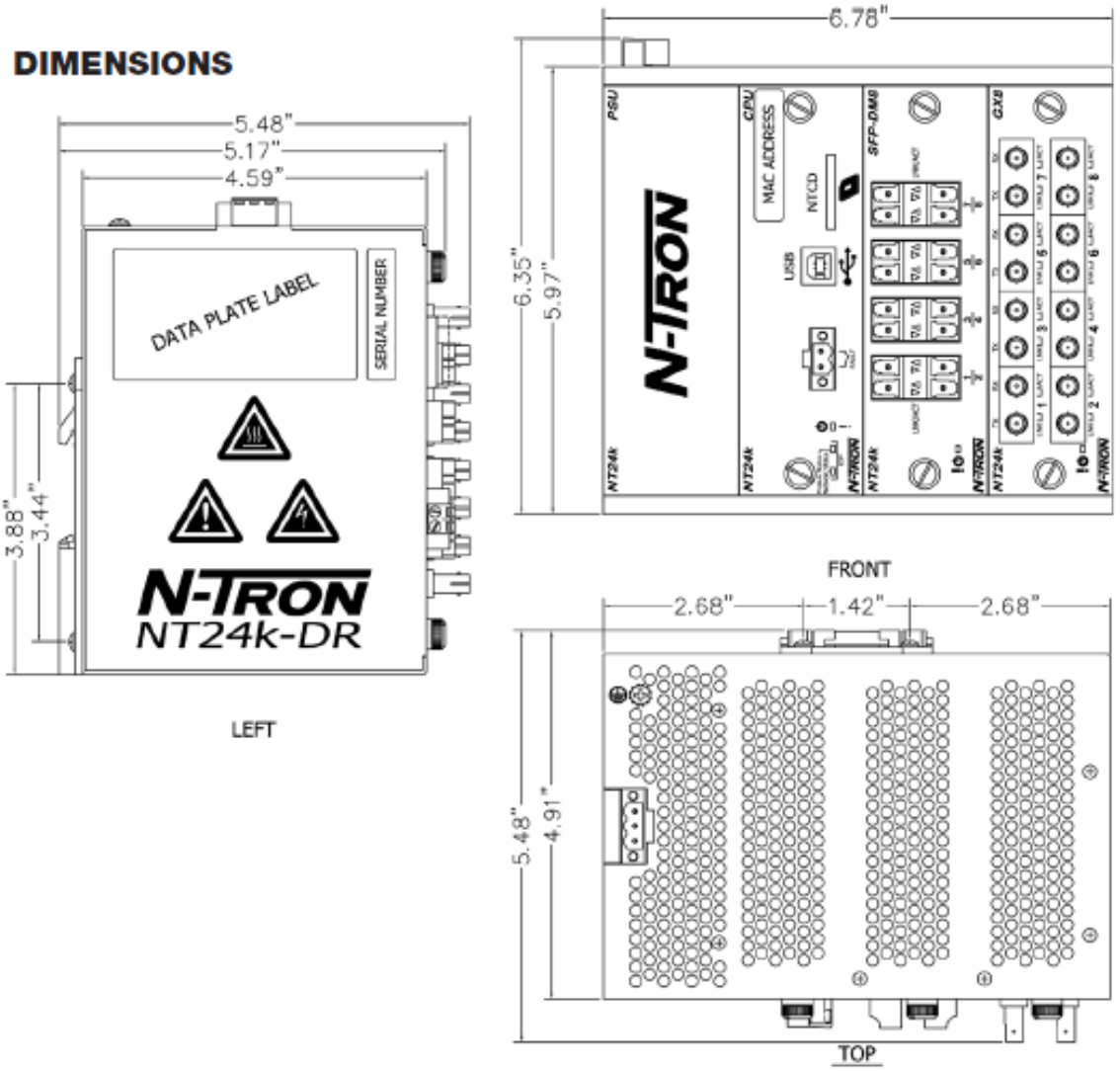
Operating Temperature: -40° C to 75° C
Operating Humidity: 5% to 100% (Non Condensing)
Operating Altitude: 0 to 10,000 ft.

MECHANICAL

Case Dimensions
Height: 5.97" (15.20 cm)
Width: 6.78" (17.22 cm)
Depth: 4.59" (11.65 cm)
Weight (maximum): 6.4 lbs (2.9 kg)
Mount: DIN rail

NT24k-DR16, Continued …

DIMENSIONS



All specifications are subject to change. Consult the company website for more information.

ORDERING GUIDE

PART NUMBER	DESCRIPTION
NT24K-DR16-DC	Managed Industrial Ethernet Switch; modular DIN rail design with 2 expansion slots; redundant 18-49VDC power input
NT24K-DR16-AC	Managed Industrial Ethernet Switch; modular DIN rail design with 2 expansion slots; 90-264VAC / 90-300VDC power inputs
NT24K-FP	Filler panel (required to fill vacant module slots)
NTCD-CFG	Configuration recovery device
NTPC-AC-US	AC power cord
NTPS-24-3	DIN rail power supply 3.0 Amp@24 VDC
NT24K-DR-PMK	NT24k DR panel mount kit

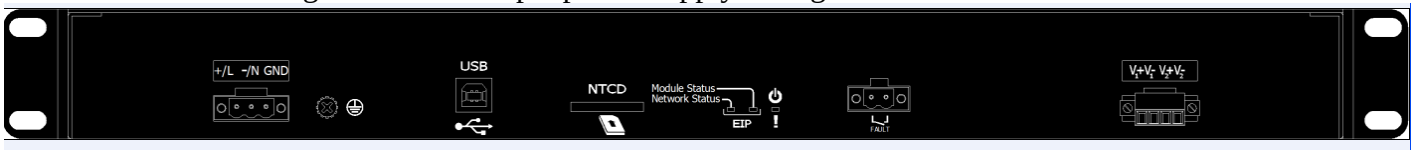
NT24k Industrial Ethernet Switch Accessories

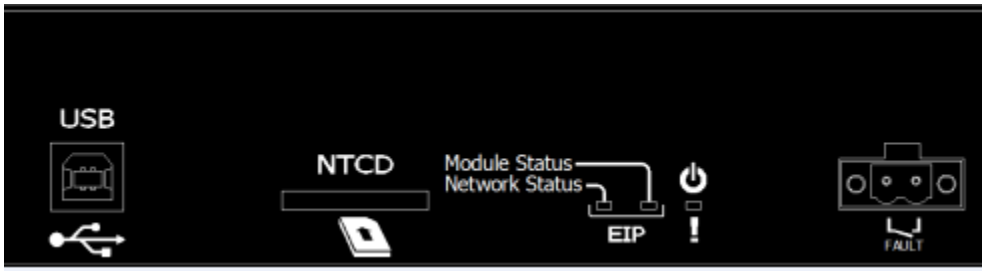
The SD and USB connectors are for temporary connection only. Do not use, connect, or disconnect unless the area is known to be non-hazardous. Connection or disconnection in an explosive atmosphere could result in an explosion.

 NTCD-CFG	Configuration Device Ideal for saving, or restoring switch configuration parameters quickly without the need for a computer or software. One configuration device per switch is recommended.

The configuration device is inserted in the back of the NT24k:

The unit could be configured with multiple power supply configuration.





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Warning

Do not perform any services on the unit unless qualified to do so. Do not substitute unauthorized parts or make unauthorized modifications to the unit.

Do not operate the unit with the top cover removed, as this could create a shock or fire hazard.

Do not block the air vents on the sides or the top of the unit.

Do not operate the equipment in the presence of flammable gasses or fumes. Operating electrical equipment in such an environment constitutes a definite safety hazard.

Do not operate the equipment in a manner not specified by this manual.

SAFETY WARNINGS

GENERAL SAFETY WARNINGS

WARNING: If the equipment is used in the manner not specified by N-Tron Corp., the protection provided by the equipment may be impaired.

LASER SAFETY (Options - NTSFP-FX, NTSFP-FXE, NTSFP-SX, NTSFP-LX)

CAUTION: CLASS 1 LASER PRODUCT. Do not stare into the laser!

Contact Information
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FAX: (251) 342-6353
WEBSITE: www.n-tron.com
E-MAIL: N-TRON_Support@n-tron.com

ENVIRONMENTAL SAFETY

WARNING: The unit may become very hot to the touch in high temperature environments, so extreme caution should be exercised in handling when energized. The unit should be disconnected from power and allowed to cool for approximately 5 minutes before touching in high temperature applications.

ELECTRICAL SAFETY

WARNING: Do not remove the top cover.

WARNING: Do not operate the unit with the any cover removed.

WARNING: Properly ground the unit before connecting anything else to the unit. Units not properly grounded may result in a safety risk and could be hazardous and may void the warranty. See the grounding technique section of this user manual for proper ways to ground the unit.

WARNING: Do not work on equipment or cables during periods of lightning activity.

WARNING: Do not perform any services on the unit unless qualified to do so.

WARNING: Do not block the air vents.

WARNING: Observe proper DC Voltage polarity when installing power input cables. Reversing voltage polarity can cause permanent damage to the unit and void the warranty.

Hazardous Location Installation Requirements

1. This equipment is suitable for use in Class I, Division 2, Groups A, B, C, and D or non-hazardous locations only.

2. **WARNING:** Explosion Hazard – Substitution of components may impair suitability for Class I, Div. 2.

3. **WARNING:** Explosion Hazard - do not disconnect while circuit is live, unless area is known to be non-hazardous.

4. **WARNING:** Explosion Hazard – do not replace the device unless power has been switched off or the area is known to be non-hazardous.

5. **Surrounding Air Temperature:** Rack Mount: -40˚C - 85˚C
   Surrounding Air Temperature: DIN Rail 24 and 16: -40˚C - 75˚C

6. NT24k must be powered by a Class 2 source evaluated to UL1310 only.

7. Use 105°C or higher rated Copper wire, (0.22Nm) 2lb/in Tightening torque for field installed conductors.

8. **WARNING:** Exposure to some chemicals may degrade the sealing properties of materials used in the following devices and should be periodically inspected for any degradation and replaced as necessary; Relay by Panasonic, Part No. TX2SS-3V, or Omron, part G6S2FDC3.

Please make sure the NT24k Ethernet Switch package contains the following items:

1. NT24k Switch
2. Product CD

Contact your carrier if any items are damaged.

Installation

Read the following warning before beginning the installation:

WARNING

Never install or work on electrical equipment or cabling during periods of lightning activity. Never connect or disconnect power when hazardous gasses are present.

Disconnect the power cable before removing any enclosure panel.

UNPACKING

Remove all the equipment from the packaging, and store the packaging in a safe place. File any damage claims with the carrier.

CLEANING

Clean only with a damp cloth.

RACK AND PANEL MOUNTING

The NT24k comes configured with standard rack mount brackets which may be used to mount our products to standard 19" racks. As an alternative we offer our NT24k Panel Mount Assembly (P/N: NT24k-PM) which may be used to securely mount the NT24k products to a panel or other flat surface.

A clearance of 1 inch should be observed on the sides, back, top and bottom to allow proper ventilation. Also a cable bend radius of 4 inches should be observed for the front and back side of the unit.

The front of an NT24k with the module slots identified:

The front of an NT24k populated with modules:

From Left to Right:

RJ45 Ports TX8 Module in slot A: Auto Sensing 10/100/1000 Base-TX Connections
Fiber Ports FX8 ST Module in Slot B: Eight of 100 based fiber ports
SFP8 Eight of SFP ports

⏻ Lower Left LED lights when Power is supplied to unit.

SFP Transceiver	Maximum Capacity per switch	Module Required
NTSFP-TX	Up to 16	NT24k-SFP8 or NT24k-DM8
NTSFP-FX	Up to 24	NT24k-DM8
NTSFP-SX	Up to 24	NT24k-SFP8 or NT24k-DM8
NTSFP-LX	Up to 24	NT24k-SFP8 or NT24k-DM8

NOTE: The RJ45 data ports have two LEDs located on each connector. The left LED indicates LINK status, and the right LED indicates ACTIVITY.

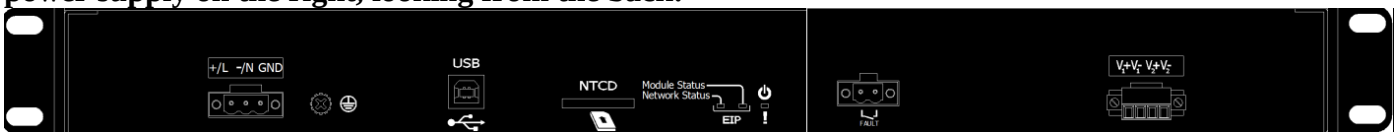
LEDs: The table below describes the operating modes:

LED	Color	Description
⏻	GREEN	Power is ON
	RED	Power is ON and a fault condition exists
	OFF	Power is OFF
LNK	GREEN	10/100/1000Mb Link between ports
	OFF	No Link between ports
ACT	GREEN	Data is active between ports. Activity light blink rate indicates activity, not necessarily the volume of activity.
	OFF	Data is inactive between ports

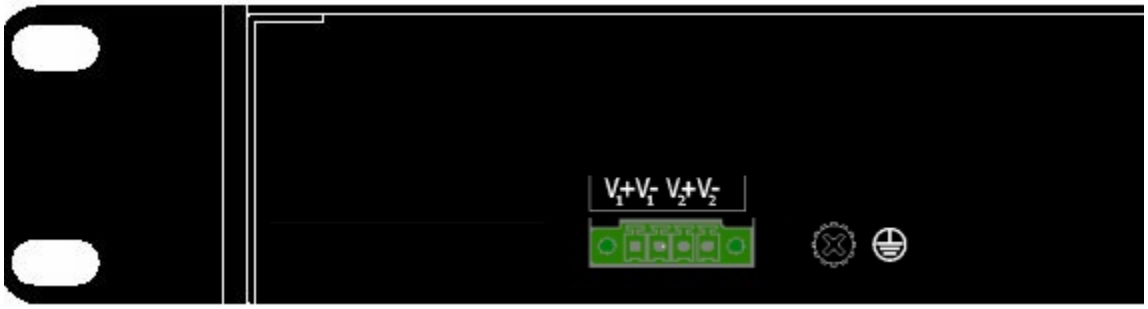
APPLYING POWER AND FAULT CONNECTIONS (Back View)

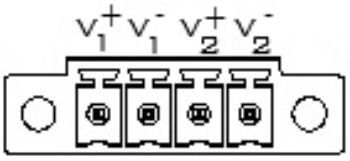
All NT24k can operate with one power supply, either AC or DC. The Rack Mount NT24k can accept up to two power supply units. Each power supply can be AC or DC. Each low voltage DC Power supply includes redundancy (two DC supplies).

The example below is shown from the back and includes a AC Power supply on the left and a DC power supply on the right, looking from the back:



NT24k with DC Power Supply Installed:





- Unscrew & Remove the DC Voltage Input Plug from the Power Input Header
- Install the DC Power Cables into the Plug (observing polarity).
- Plug the Voltage Input Plug back into the Power Input Header.
- Tightening torque for the terminal block power plug is **0.5 Nm/0.368 Pound Foot.**
- Verify the Power LED stays ON.

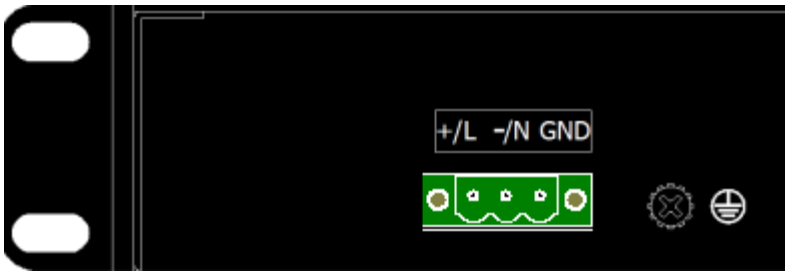
Notes:

- When a DC Power supply is installed, only one power supply must be connected to power for minimal operation. For redundant power operation, V_1 and V_2 inputs must be connected to separate DC Voltage sources. This device will draw current from both sources simultaneously. Use 16-28 gauge wire when connecting to the power supply.

Recommended 24V DC Power Supplies, similar to: N-Tron's P/N **NTPS-24-1.5**

- Input AC 115/230V
- Output DC 24-28V
- Output Current 1.5A @ 24V
  1.0A @ 28V
- Power 36W
- 35 mm DIN-Rail Mountable
- Dimensions: 45X75X91 mm

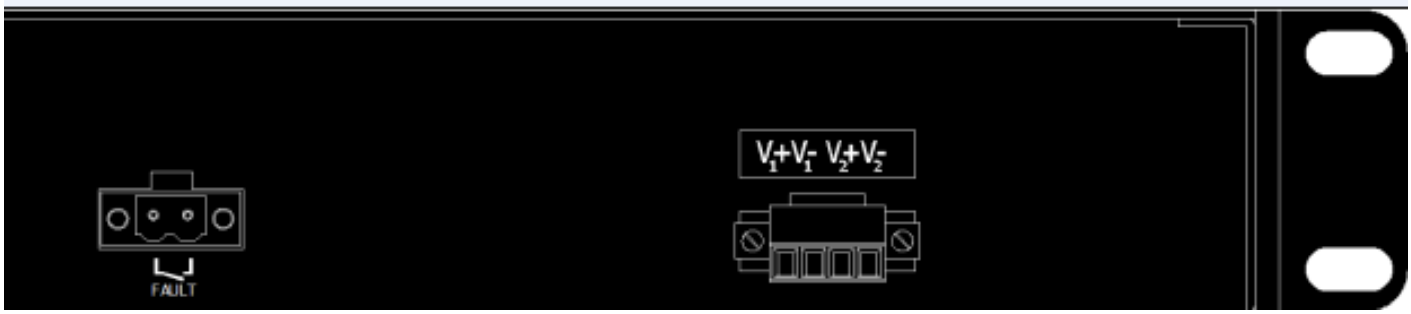
NT24k with AC Power Supply Installed:



- Unscrew & Remove the AC Voltage Input Plug from the Power Input Header
- Install the AC Power Cables into the Plug (observing polarity).
- Plug the Voltage Input Plug back into the Power Input Header.
- Tightening torque for the terminal block power plug is **0.5 Nm/0.368 Pound Foot.**
- Verify the Power LED stays ON.

- When an AC Power supply is installed (i.e., the –AC option), Use 12-24 gauge wire when connecting to the power supply.

NT24k Fault Pins



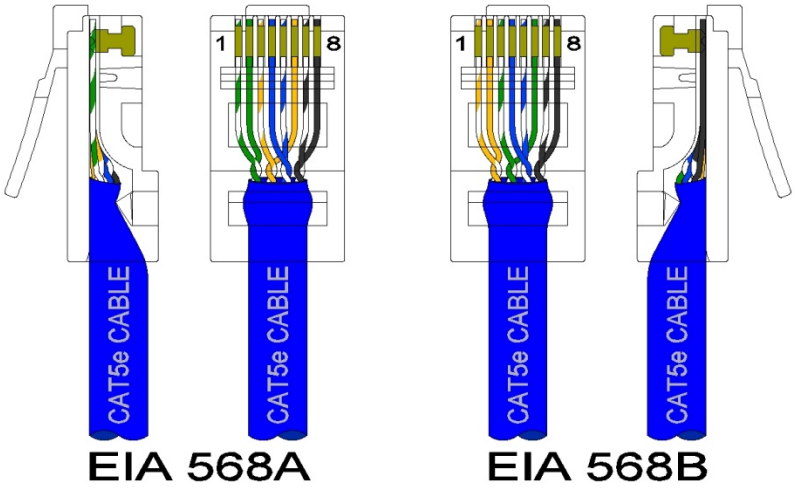
The Fault pins on the back of the NT24k can be used for an alarm contact. The current carrying capacity is 1A at 24VDC. It is normally open and the relay closes when a fault condition occurs, though this can be reversed via configuration. These pins can be used to connect an external warning device such as a light in order to provide an external alarm. The conditions for generating a fault condition (closing the relay) can be configured through software.

Connecting the Unit

For FX/FXE units, remove the dust cap from the fiber optic connectors and connect the fiber optic cables. The TX port on the FX/FXE models should be connected to the RX port of the far end station. The RX port on the FX/FXE versions should be connected to the TX port of the far end station.

For 10/100/1000/T(x) ports, plug a Category 5E twisted pair cable into the RJ45 connector. Connect the other end to the far end station. Verify that the LNK LEDs are ON once the connection has been completed. To connect any port to another device (end node, Switch or Repeater), use a standard Category 5E straight through or crossover cable with a minimum length of one meter and a maximum length of 100 meters.

N-Tron recommends the use of pre-manufactured Cat5E cables to ensure the best performance. If this is not an option and users must terminate their own ends on the Cat5E cables; one of the two color coded standards shown to the right should be utilized. If a user does not follow one of these two color code standards then the performance and maximum cable distance will be reduced significantly, and may prevent the switch from establishing a link.



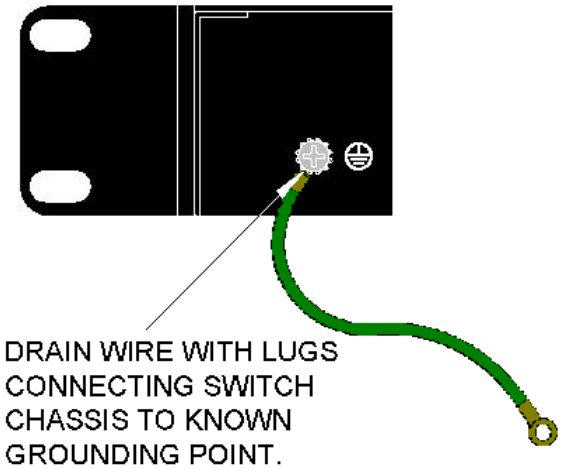
Warning: Creating a port to port connection on the same switch (i.e. loop) is an illegal operation and will create a broadcast storm which will crash the network!

N-TRON SWITCH GROUNDING TECHNIQUES

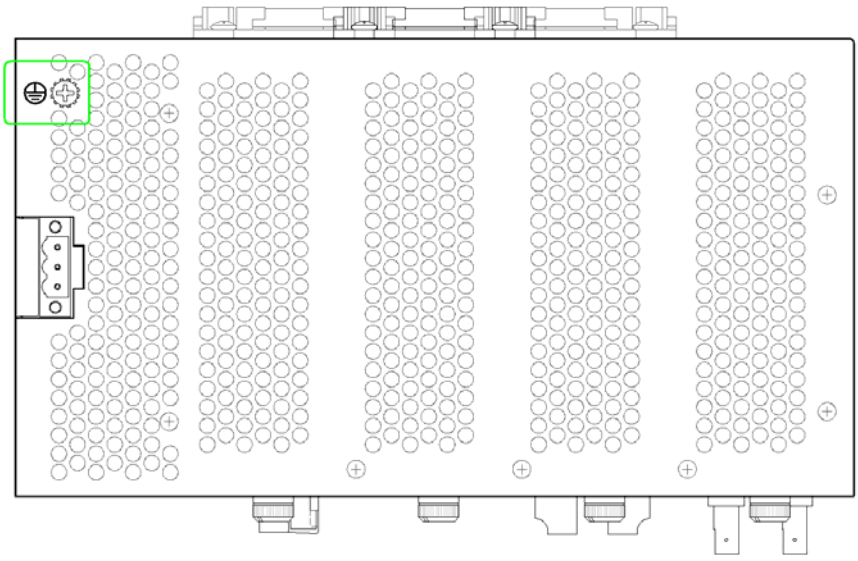
The grounding philosophy of any control system is an integral part of the design. N-Tron switches are designed to be grounded, but the user has been given the flexibility to float the switch when required. The best noise immunity and emissions (i.e. CE) are obtained when the N-Tron switch chassis is connected to earth ground via a drain wire. In the case of both the DC and AC Power supply options for the NT24k/NT24k-AC the power supply is isolated from chassis ground. Therefore the user must not attempt to ground the switch to earth ground via the power supply. In other N-Tron switches it is common to use the V- for the purpose of grounding. This must NOT be attempted in the NT24k or NT24k-AC.

In the case of the AC power supply option (i.e., NT24k-AC) the chassis may be connected to earth ground using the safety input of the input power plug labeled "GND" (refer to the drawing above which shows the pin out of the AC power plug) or using the ground lug located at the rear of the chassis (see adjacent illustration).

In the case of the NT24k, the only viable safety ground option is using the ground lug at the rear of the chassis (see adjacent illustration).



For the Din-Rail models see the illustration below for grounding:

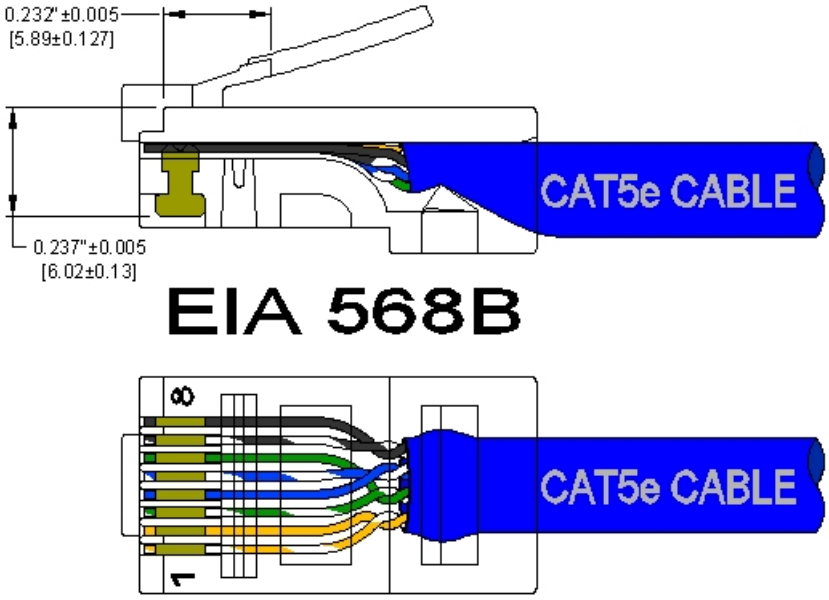


If the use of shielded cables is required, it is generally recommended to only connect the shield at one end to prevent ground loops and interference with low level signals (i.e. thermocouples, RTD, etc.). Cat5e cables manufactured to EIA-568A or 568B specifications are required for use with N-Tron Switches.

In the event all Cat5e patch cable distances are small (i.e. All Ethernet devices are located in the same local cabinet and/or referenced to the same earth ground), it is permissible to use fully shielded cables terminated to chassis ground at both ends in systems void of low level analog signals.

RJ45 CONNECTOR CRIMP SPECIFICATIONS

Please reference the illustration below for your Cat5 cable specifications:

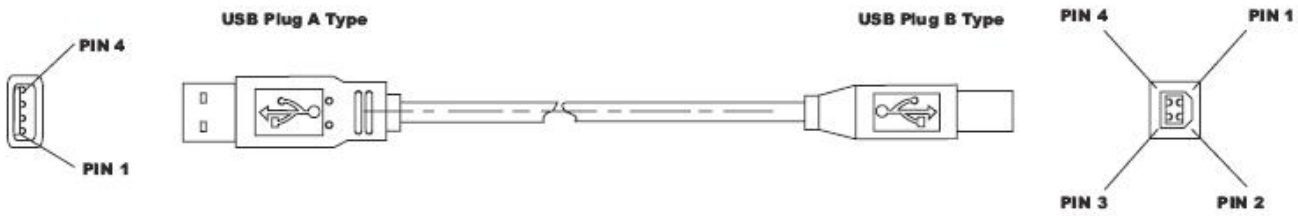


USB INTERFACE

The NT24k switches provide a USB interface accessed via the USB connector labeled as “USB” on the back of the unit near the center. This is used to access the Command Line Interpreter (CLI) or PPP (*Point-to-Point Protocol*). PPP allows any configuration and status that the browser does.

USB Cable

Connect the USB port of your PC and the Switch using a standard USB cable. You will require a cable with a Type A connector for the PC end, and a Type B connector for the Switch end.



Standard USB cables are readily available from a variety of computer stores.

HyperTerminal

The following configuration should be used in HyperTerminal:

Port Settings:	**115200**
Data Bits:	**8**
Parity:	**NONE**
Stop bits:	**1**
Flow Control:	**NONE**

Overview of Advanced Features

Mode of Operation

Each port on the switch can be configured into different modes of operation as shown below:

Copper Ports:	1000Base Copper or any Fiber Ports:
- Half Duplex	- Full Duplex
- Full Duplex	
- Auto Negotiation	

Half Duplex

In half duplex mode, the CSMA/CD media access method is the means by which two or more stations share a common transmission medium. To transmit, a station waits (defers) for a quiet period on the medium (that is, no other station is transmitting) and then sends the intended message in bit-serial form. If, after initiating a transmission, the message collides with that of another station, then each transmitting station intentionally transmits for an additional predefined period to ensure propagation of the collision throughout the system. The station remains silent for a random amount of time (back-off) before attempting to transmit again.

Full Duplex

Full duplex operation allows simultaneous communication between a pair of stations using point-to-point media (dedicated channel). Full duplex operation does not require that transmitters defer, nor do they monitor or react to receive activity, as there is no contention for a shared medium in this mode.

Auto Negotiation

In Auto Negotiation mode, the port / hardware detects the mode of operation of the station that is connected to this port and sets its mode to match the mode of the station.

Port Mirroring

A Mirroring Port is a dedicated port that is configured to receive the copies of Ethernet frames that are being transmitted out and also being received in from any other port that is being monitored.

Port Trunking

Port Trunking is the ability to group network ports to increase the bandwidth between two machines (switch or any work station). This feature allows grouping of high-speed connectivity and provides redundant connection between switches, so that a trunk can act as a single link between the switches.

Quality of Service (QoS)

Quality of service (QoS) refers to resource reservation control mechanisms. Quality of service is the ability to provide different priority to different applications, users, or data flows. Quality of service guarantees are important if the network capacity is insufficient, especially for real-time streaming multimedia applications such as voice over IP, online games and IP-TV, since these often require fixed bit rate and are delay sensitive, and in networks where the capacity is a limited resource, for example in cellular data communication. In the absence of network congestion, QoS mechanisms are not required.
Each of the three QOS methods below may be included based on the settings on the relevant browser page:

1) IEEE802.1p (Tagged QOS), or
2) DSCP (differentiated services code points) (RFC 2474).
3) Port ('Default Priority') (if not one or4 both of the two above)

Virtual LAN

The switch provides support for setting up tagged Virtual LANs (Local Area Networks). A port may belong to any number of Virtual LANs. The VLAN membership of a device is determined by the VLAN(s) that have been defined for the port to which the device is connected. If a device should move from one port to another, it loses its current VLAN membership and inherits that of the new port it is connected to.

VLANs facilitate easy administration of logical groups of devices that can communicate as if they were on the same LAN. **Traffic between VLANs is restricted, unless the ports are explicitly configured as overlapping VLANs**. Switches forward unicast, multicast, and broadcast traffic only on LAN segments that serve the VLAN to which the traffic belongs.

A Default Virtual LAN (VID=1) exists to which a port, which is not a member of any other Virtual LAN, will belong. This allows the switch to operate as a 'normal' switch when it is used in a network. A port may be automatically removed (or not) from the Default VLAN when it is reconfigured to belong to another Virtual LAN, because that is the most common operation.

If switch ports are configured to transmit and receive untagged frames, end devices are able to communicate throughout the LAN. Using Tagged VLANs, the switch has the ability to take non-tagged packets in some ports, add a VLAN tag to the packet and send it out tagged ports on the switch. The VLANs can also be configured to accept tagged packets in tagged ports, strip the tags off the packets, and send the packets back out other untagged ports. This allows a network administrator to set up the switch to support devices on the network that do not support VLAN Tagged packets. The administrator can also set up the ports to discard any packets that are tagged or to discard any packets that are untagged based on a hybrid VLAN of both tagged and untagged ports, and using the VLAN Ingress Filter on the switch.

For each switch port there is one and only one PVID (port VLAN ID) setting. If an incoming frame is untagged and untagged frames are being accepted, then that frame will inherit the tag of the PVID value for that port. Subsequent switch routing and treatment will be in accordance with that VLAN switch map. By configuring PVIDs properly and configuring for all frames to exit untagged, the switch can achieve a 'port VLAN' configuration in which all frames in and out can be untagged, thus not requiring external devices to be VLAN cognizant.

To understand how a VLAN configuration will perform, first look at the port on which the frame enters the switch, then the VLAN ID (if the frame is tagged) or the PVID (if the frame is untagged). The VLAN defined by the VID or PVID defines a VLAN group with a membership of ports. This membership determines whether a port is included or excluded as to frame egress from the switch.

The NT24k switch also has the ability to allow overlapping VLANs. Overlapping VLANs give the user the ability to have one or more ports share two or more VLAN groups. For more information and examples on how this could be implemented, please see the 'VLAN Configuration Examples' in this document, and/or our website's technical documents. Note that RSTP is supported on a single VLAN.

Rapid Spanning Tree Protocol

The Rapid Spanning Tree Protocol as specified in IEEE 802.1D-2004 is supported. One Spanning Tree on one VLAN is supported. The Rapid Spanning Tree Protocol (RSTP) supersedes the Spanning Tree Protocol (STP) which was described in IEEE 802.1D-1998. The RSTP establishes a simply connected active network topology from the arbitrarily connected bridges of a bridged network. Bridges effectively connect just the LANs to which their forwarding ports are attached. Ports that are in a blocking state do not forward frames. The bridges in the network exchange sufficient information to automatically derive a spanning tree.

RSTP allows for much quicker learning of network topology changes than the older STP. RSTP supports new and improved features such as rapid transition to forwarding state. Rather than forwarding them from the root bridge, RSTP also sends out new BPDUs every hello time. RSTP interoperates with older STP switches by falling back to STP when the older BPDUs are detected on bridge ports. The user can also manually configure bridge ports to use STP when desired.

SNMP Traps

The NT24k switch supports SNMP Trap Stations to which SNMP Traps will be sent. The switch supports four standard traps; Link Status (Link Up / Link Down), Cold Start, Warm Start, and Authentication Errors. SNMP Traps will be sent to all the trap stations configured on the switch when the corresponding trap is enabled.

IGMP Snooping

IGMP Snooping is enabled by default, and the switch is *Plug and Play* for IGMP. IGMP snooping provides intelligent network support for multicast applications. In particular, unneeded traffic is reduced. IGMP Snooping is configured via the web console and if enabled, operates dynamically upon each power up. Also, there can be manual only or manual and dynamic operation. Note that "static multicast group address" can be used whether IGMP Snooping is enabled or not.

IGMP Snooping will function dynamically without user intervention. If some of the devices in the LAN do not understand IGMP, then manual settings are provided to accommodate them. The Internet Group Management Protocol (IGMP) is a protocol that provides a way for a computer to report its multicast group membership to adjacent 'routers'. In this case N-Tron NT24k switches provide *router-like functionality*. Multicasting allows one computer to send content to multiple other computers that have identified themselves as interested in receiving the originating computer's content. Multicasting can be used to transmit only to an audience that has joined (and not left) a multicast group membership. IGMP version 2 is formally described in the Internet Engineering Task Force (IETF) Request for Comments (RFC) 2236.

IGMP version 1 is formally described in the Internet Engineering Task Force (IETF) Request for Comments (RFC) 1112. The NT24k supports v1 and v2.

N-Ring

N-Ring is enabled by default, and the switch is *Plug and Play* for N-Ring except that initially one must enable an N-Ring enabled device to be the N-Ring Manager for a given N-Ring. Subsequently, N-Ring operates dynamically upon each power up. Using N-Tron's proprietary N-Ring technology offers expanded ring size capacity, detailed fault diagnostics, and a standard healing time of 30ms. The N-Ring Manager periodically checks the health of the N-Ring via health check packets. If the N-Ring Manager stops receiving the health check packets, it times out and converts the N-Ring to a backbone within 30ms. When using all N-Ring enabled switches in the ring, a detailed ring map and fault location chart is also provided on the N-Ring Manager's web browser. N-Ring status is also sent from the N-Ring Manager to the N-View OPC Server to identify the health status of the ring. Up to 250 N-Ring enabled switches can participate in one N-Ring topology. Switches that do not have N-Ring capability may be used in an N-Ring, however the ring map and fault location chart cannot be as detailed at these locations.

PPP

Point to Point Protocol (PPP) allows a browser like interface over the CLI port.

Telnet

Telnet allows a CLI like interface over the internet. The NT24k supports up to two concurrent Telnet users.

DHCP Client

The switch will automatically obtain an IP assignment from a DHCP Server, or optionally Fallback to a configured IP assignment if unable to get an IP assignment from a DHCP server. Communication between the client and server can optionally go through a DHCP Relay Agent. The DHCP Client is enabled in factory defaults, with 192.168.1.210 as the faillback address.

TROUBLESHOOTING

1. Make sure the ⏻ (Power LED) is ON.
2. Make sure you are supplying sufficient current for the version chosen. Note: The Inrush current will exceed the steady state current by ~ 2X.
3. Verify that Link LEDs are ON for connected ports.
4. Verify cabling used between stations.
5. Verify that cabling is Category 5E or greater for 100Mbit and Gigabit operation.

SUPPORT

Contact N-Tron Corporation at:
TEL: 251-342-2164
FAX: 251-342-6353
E-MAIL: N-TRON_Support@n-tron.com
WEB: www.n-tron.com

FCC STATEMENT

This product complies with Part 15 of the FCC-A Rules.
Operation is subject to the following conditions:
(1) This device may not cause harmful Interference
(2) This device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this device in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense.

INDUSTRY CANADA

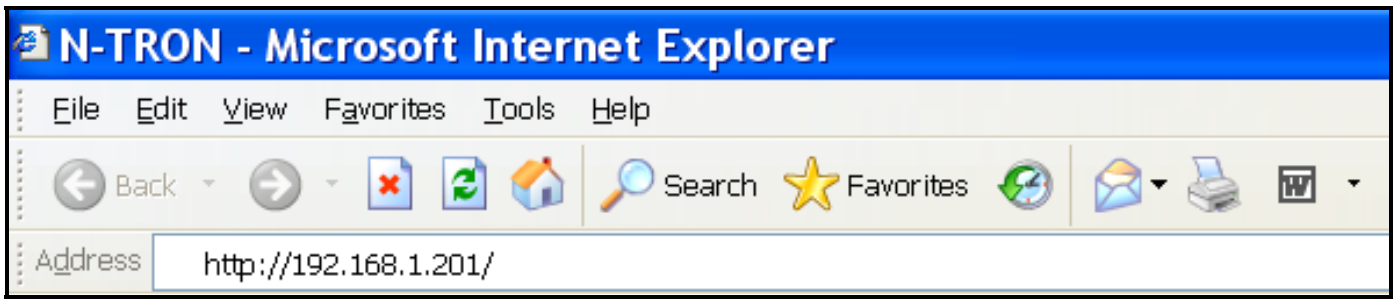
This Class A digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations. Operation is subject to the following two conditions; (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Cet appareillage numérique de la classe A répond à toutes les exigences de l'interférence canadienne causant des règlements d'équipement. L'opération est sujette aux deux conditions suivantes: (1) ce dispositif peut ne pas causer l'interférence nocive, et (2) ce dispositif doit accepter n'importe quelle interférence reçue, y compris l'interférence qui peut causer l'opération peu désirée.

Web Software Configuration

Web Management

Enter the switch's IP address in any web browser and login to the web management feature of the NT24k. The DHCP Client is enabled in factory defaults, with 192.168.1.210 as the faillback address.



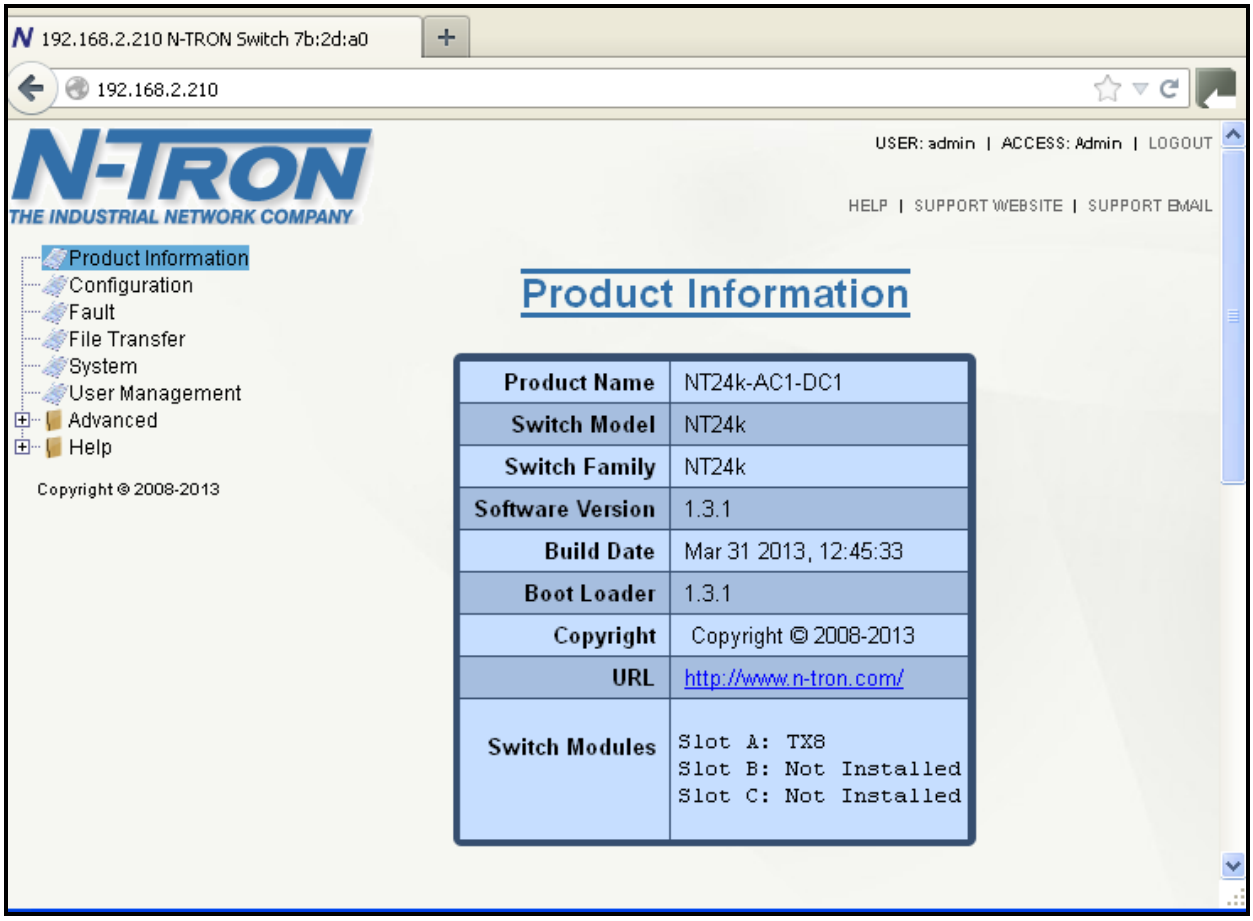
Default:

User Name: ***admin***
Password: ***admin***

Up to 5 concurrent web users are allowed.

Web Management - Product Information Page

When the administrator either first logs onto a NT24k switch or selects the page on the left, the Product Information page will be displayed. On the left hand side of the screen there is a list of configurable settings that the NT24k switch will support. This section of the manual will go through each and every choice listed on the left hand side of the screen and explain how to configure those settings. In the center of the main home page the administrator can see some basic information like what firmware revision the switch is running. The firmware can be upgraded at a later time in the field using http.



The Product Information page lists various information about the switch:

Product Name: The full name of this switch model, including any factory configured options.

The Product Name says -AC1 if there is one AC in either location and -AC2 if there are two of AC power units. Also, Product Name says -DC1 if there is one DC in either location and -DC2 if there are two of DC power units.This matches the Part Number on the Data Sheet.

Switch Model: The base model of this switch.

Switch Family: The family of switches in which this model, and similar models, belong.

Software The firmware's software version.

Version:

Build Date: The firmware's build date.

Boot Loader: The boot loader's software version.

Copyright: The copyright.

URL: The company's home page on the internet.

Switch Modules: The presently installed modules, including SFP transceivers.

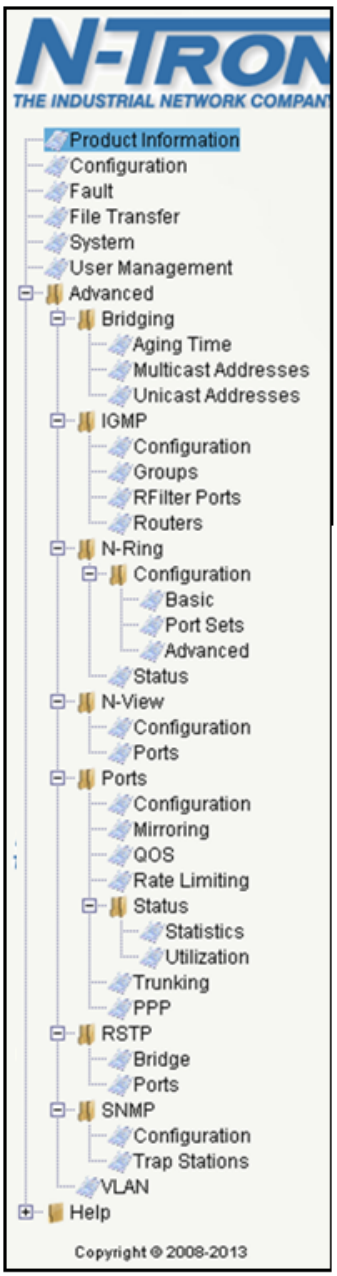
Web Management – Menu Structure

To the left, there is a menu which is shown fully opened below, in three parts). The pages opened by each of the individual selections are described in the rest of this section. The use of each of these pages is also described in this section.

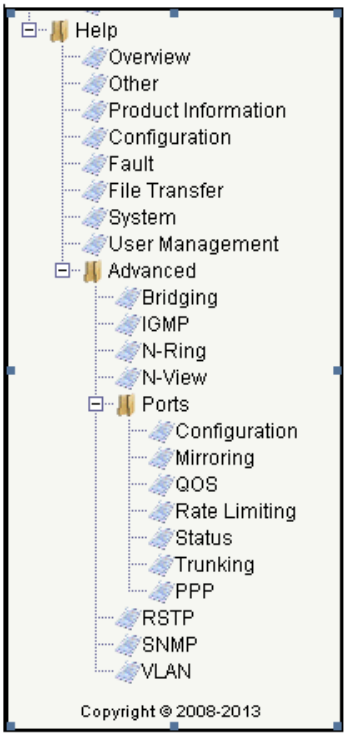
On the left is the basic navigation. Below that the 'Advanced' folder can be opened to see what is presented in the middle below. Help text can be accessed from this left hand navigation as below on the right, or by pressing 'Help' in the upper right hand corner of each browser page to get context dependent help.

Standard Menu:

Advanced menu:



Help Menu:



Configuration Page

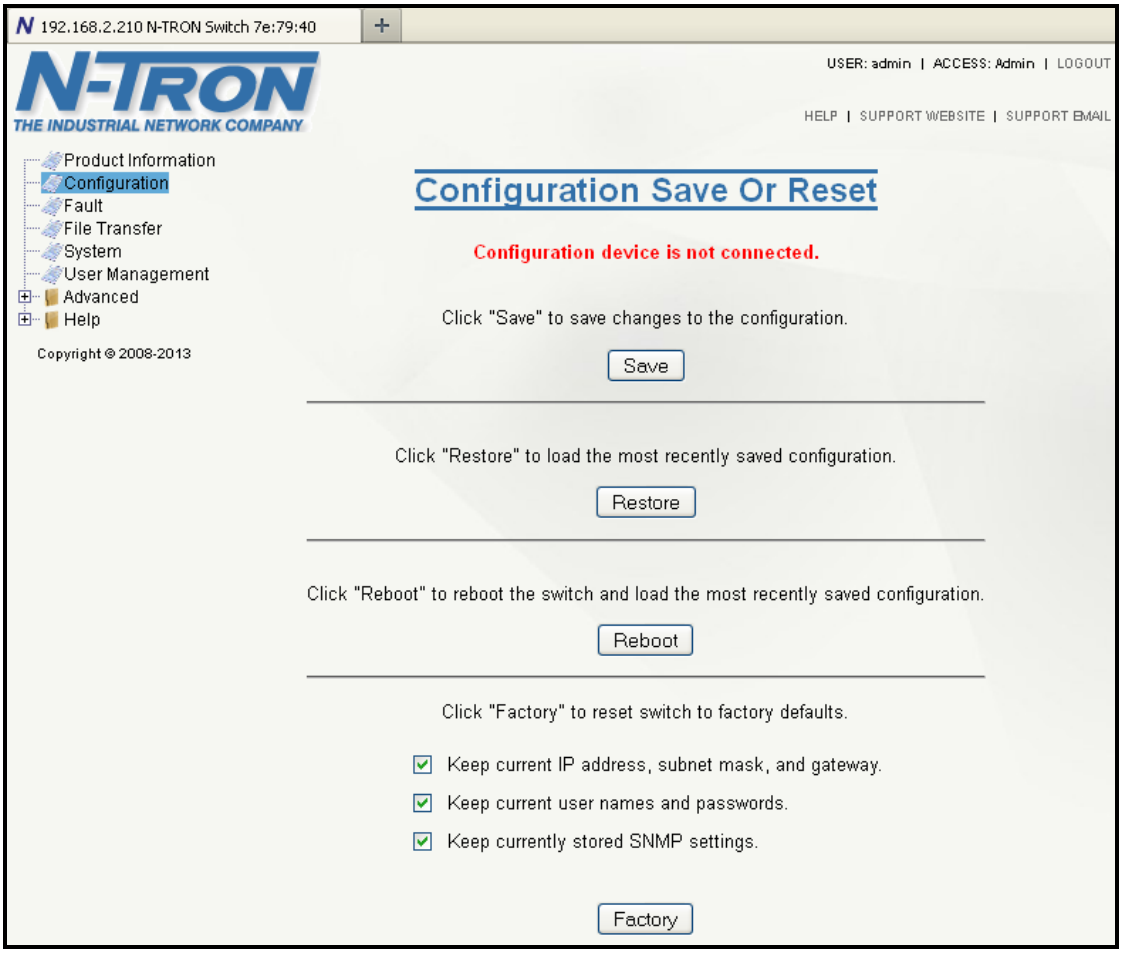
The Configuration section of web management gives an administrator the ability to save a running configuration into the NVRAM. This step is needed in order for the switch to remember any changes after a power cycle.

The “Save” button will save all current changes to the configuration for use after the next power cycle. If a configuration device is installed, the configuration will also be saved to the device.

Selecting the “Restore” button will discard all unsaved changes, and load the most recently saved configuration settings.

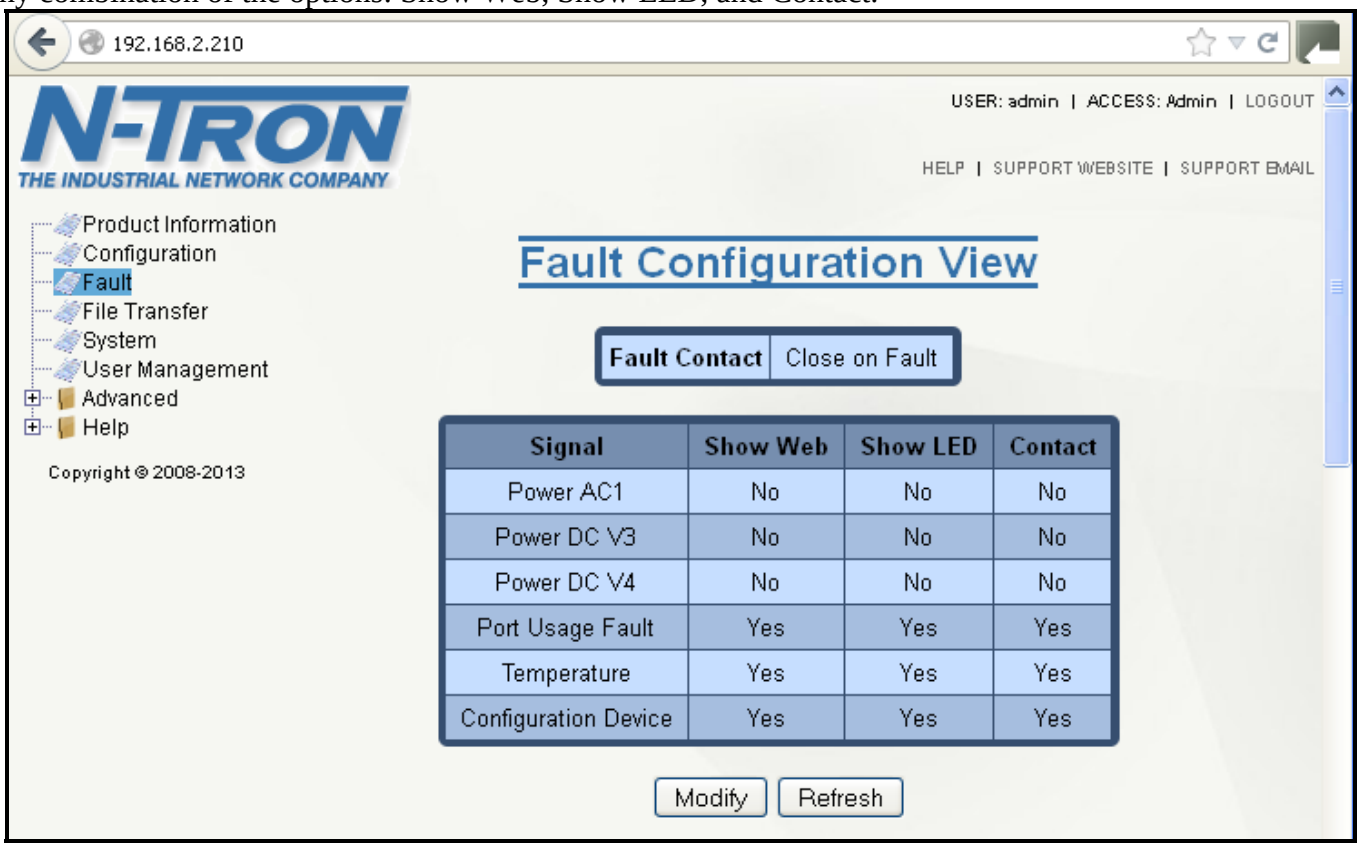
Selecting the “Reboot” button reboots the switch and reloads the most recently saved configuration. If a configuration device is installed, the configuration stored on the device will be loaded and used.

The “Factory” button resets the switch's configuration to factory defaults except for any of the user selectable items below. If a configuration device is installed, Save Configuration is then necessary to update the configuration stored on the configuration device.



Fault Page

The page provides configurable selections indicating the ways to notify when a Power, N-Ring Manager, Port Usage, Temperature, or Configuration Device fault occurs. In each case, the notification may consist of any combination of the options: Show Web, Show LED, and Contact.



Fault Contact: Determines if the fault relay is normally open (Close on Fault) or normally closed (Open on Fault).
Show Web: The fault is displayed on the browser pages.
Show LED: The fault is indicated on the Power LED as red.
Contact: The fault is indicated by opening or closing the contact switch.
Power AC (Left): Indicates low voltage on the left AC power supply.
Power AC (Right): Indicates low voltage on the right AC power supply.
The location of a power supply is based on the left or right hand side when viewing from the front of the switch. Looking from the front of the unit: AC1 is on the right side, and/or AC2 is on left side.
Port Usage Fault: Indicates that the port usage, for one or more ports, is below the Usage Alarm Low setting, or above the Usage Alarm High setting (see Port Configuration View and Port Utilization View).
Temperature: Indicates that the temperature of the switch is outside of the configured limits.
Configuration Device: Indicates that the configuration on an installed configuration device is invalid.

Fault Page, continued …

N-Ring Manager signal faults consist of: Broken, Partial Break (Low), Partial Break (High), and Multiple Managers. N-Link Faults are reported by the N-Link Master.

The location of a power supply is based on the left or right hand side of a person viewing the front of the switch. Looking from the front of the unit: DC V1 and V2 are on the right side, and DC V3 and V4 are on the left side. If a low voltage DC power supply is installed, these additional choices appear:

Power DC V_1 (Left): Indicates a low voltage on the left power supply DC V_1.

Power DC V_2 (Left): Indicates a low voltage on the left power supply DC V_2.

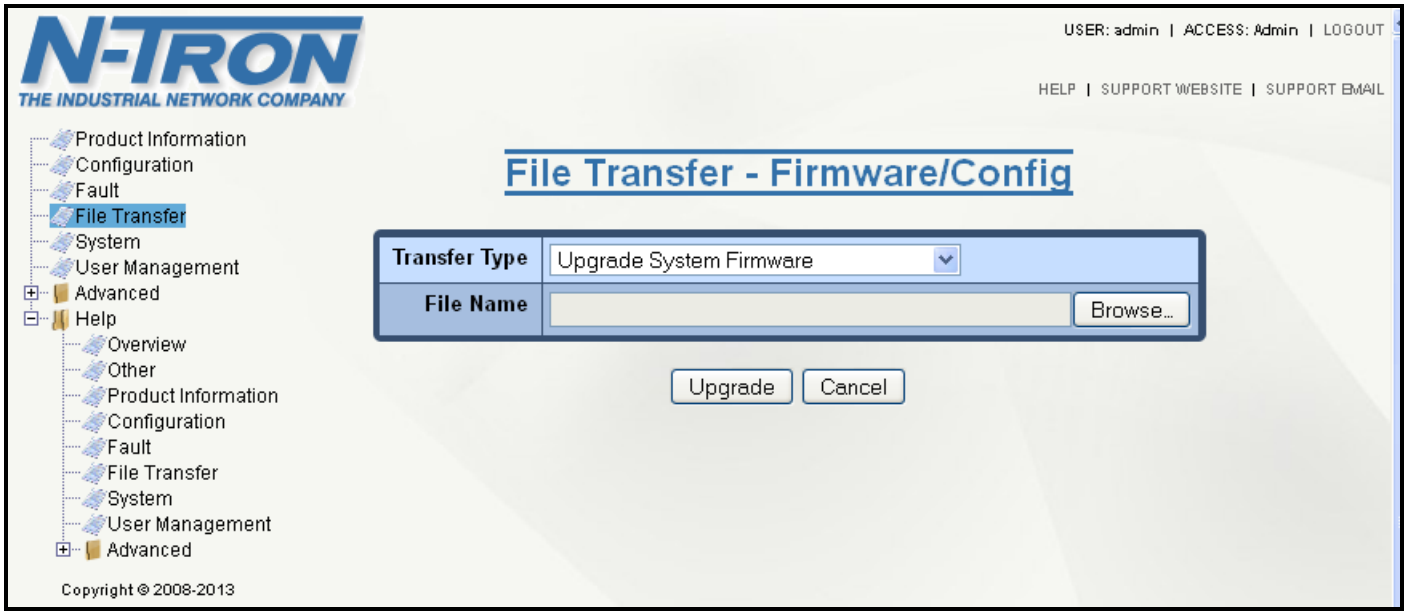
Power DC V_3 (Right): Indicates a low voltage on the right power supply DC V_3.

Power DC V_4 (Right): Indicates a low voltage on the right power supply DC V_4.

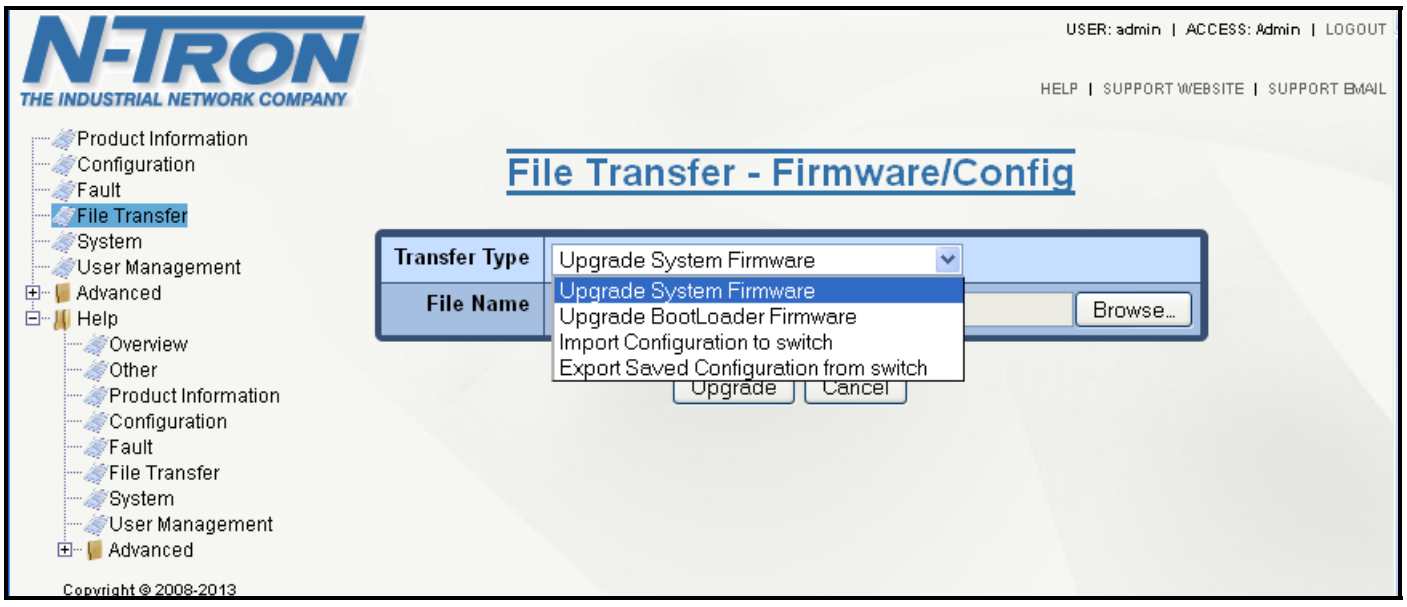
Note: V1 and V2 Power Faults are disabled in factory defaults on a low voltage DC power supply.

File Transfer Page

File Transfer gives the administrator the ability to Upgrade Image or Bootloader Firmware, or to import an XML configuration file to the switch or to export a saved XML configuration file from the NT24k switch. This allows administrators to backup their configurations to a server offsite in case they need to reload their custom configurations at a later time. Administrators can, for example, update the firmware in the field without losing their current configurations. It is important not to cycle power on the switch or interrupt the data connection between the server and the switch while you are transferring a file.



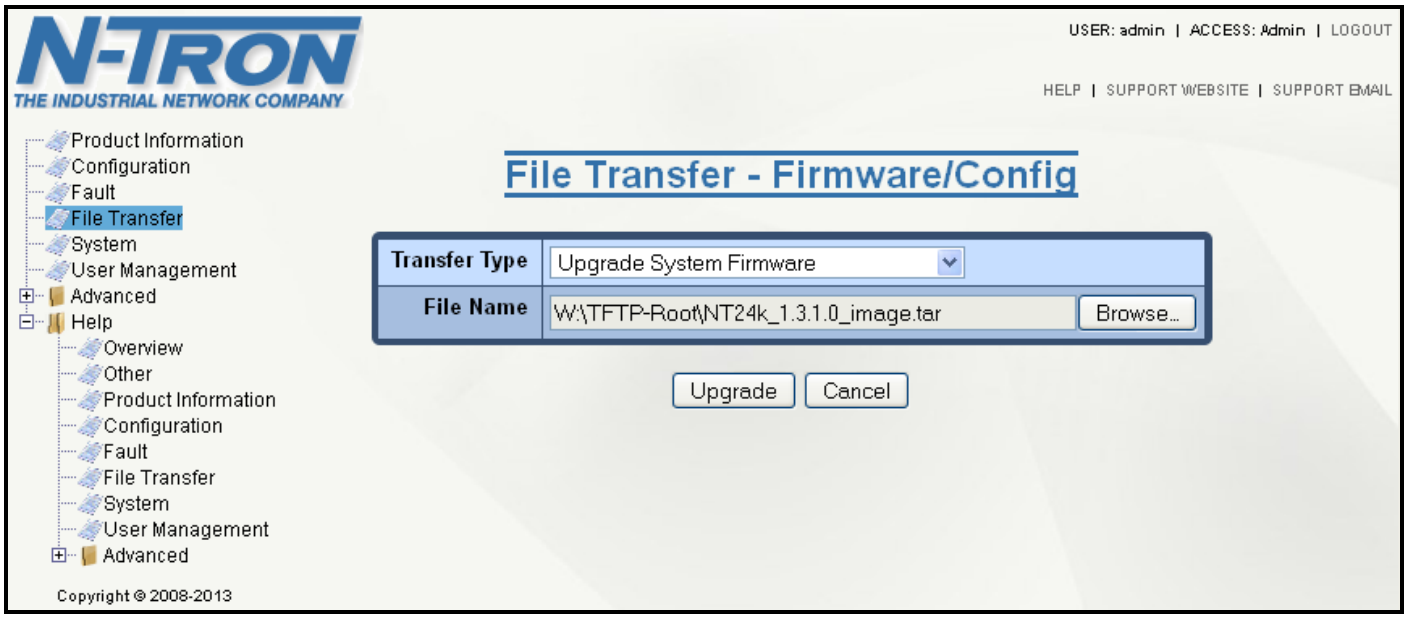
Type of transfer to be performed: Choices are: Upload image to switch, Upload bootloader to switch, Import Configuration to switch, or Export Saved Configuration from switch.



File Transfer, continued …

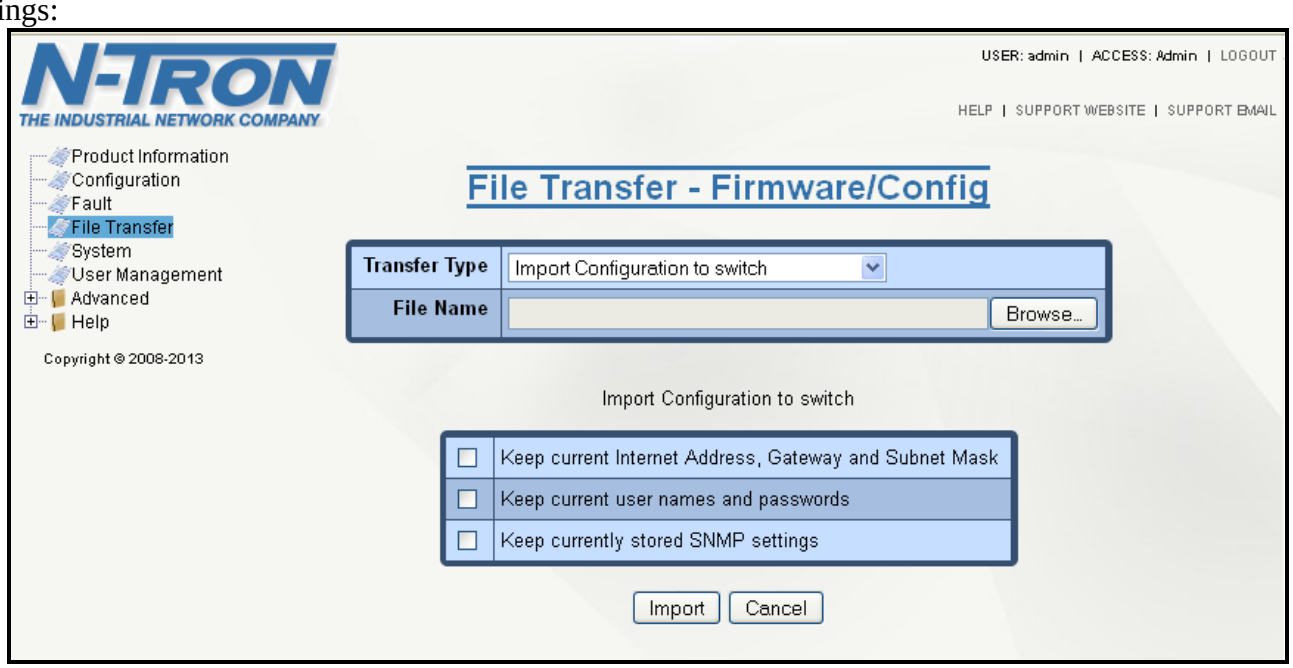
When “Upgrade Image Firmware”, “Upgrade BootLoader Firmware", or “Import Configuration to switch” is selected, you can browse and select an image or configuration file to upgrade with.

Reference Appendix A – XML Configuration File – Factory Defaults.



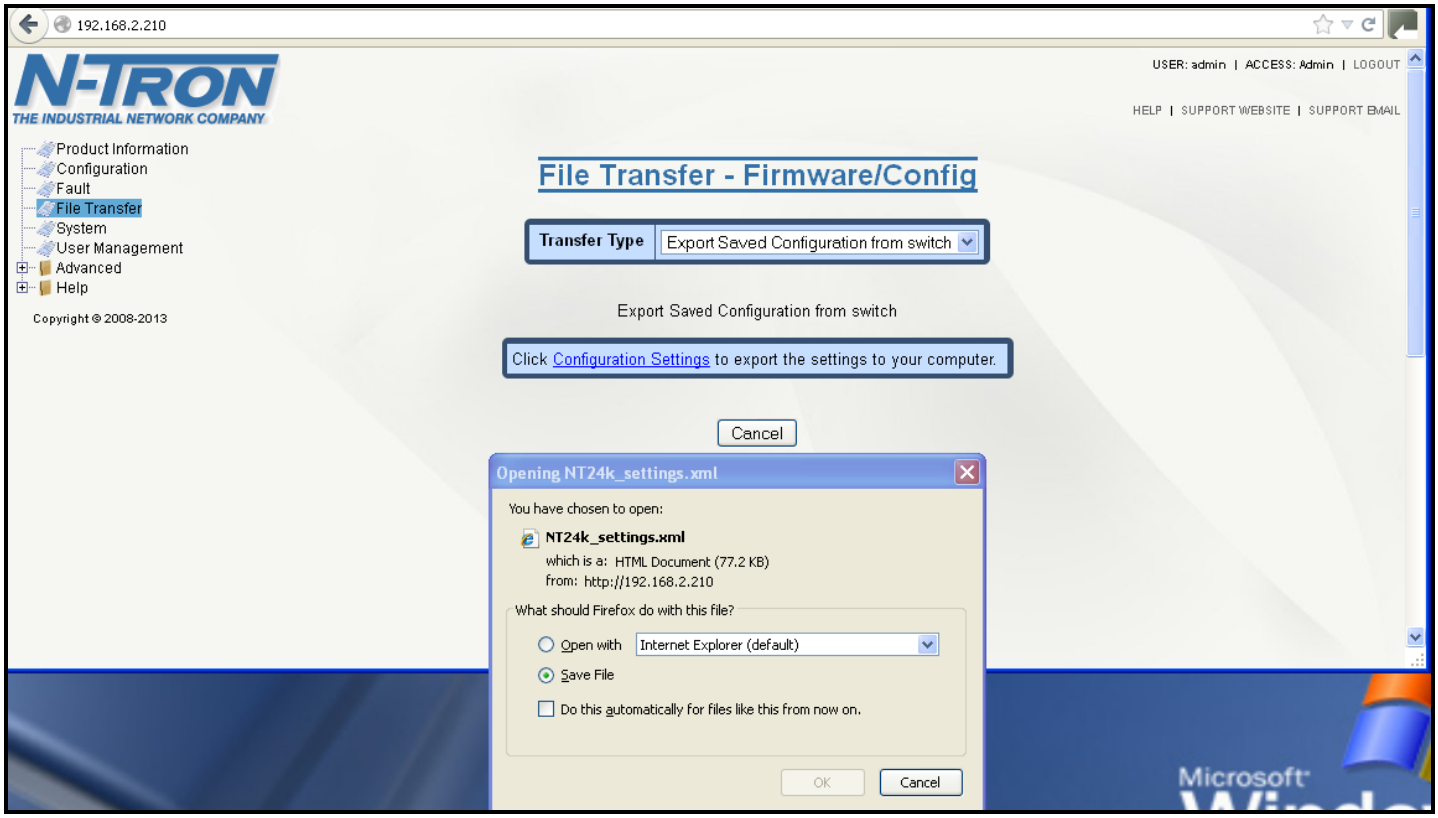
NOTE THAT YOU MUST REBOOT THE SWITCH TO BEGIN RUNNING THE NEWLY UPGRADED IMAGE.

On “Import Configuration to switch” the existing Internet Address, Gateway, and Subnet Mask can be retained. Also, you can retain the current user names and passwords, and/or the currently stored SNMP settings:



File Transfer, continued …

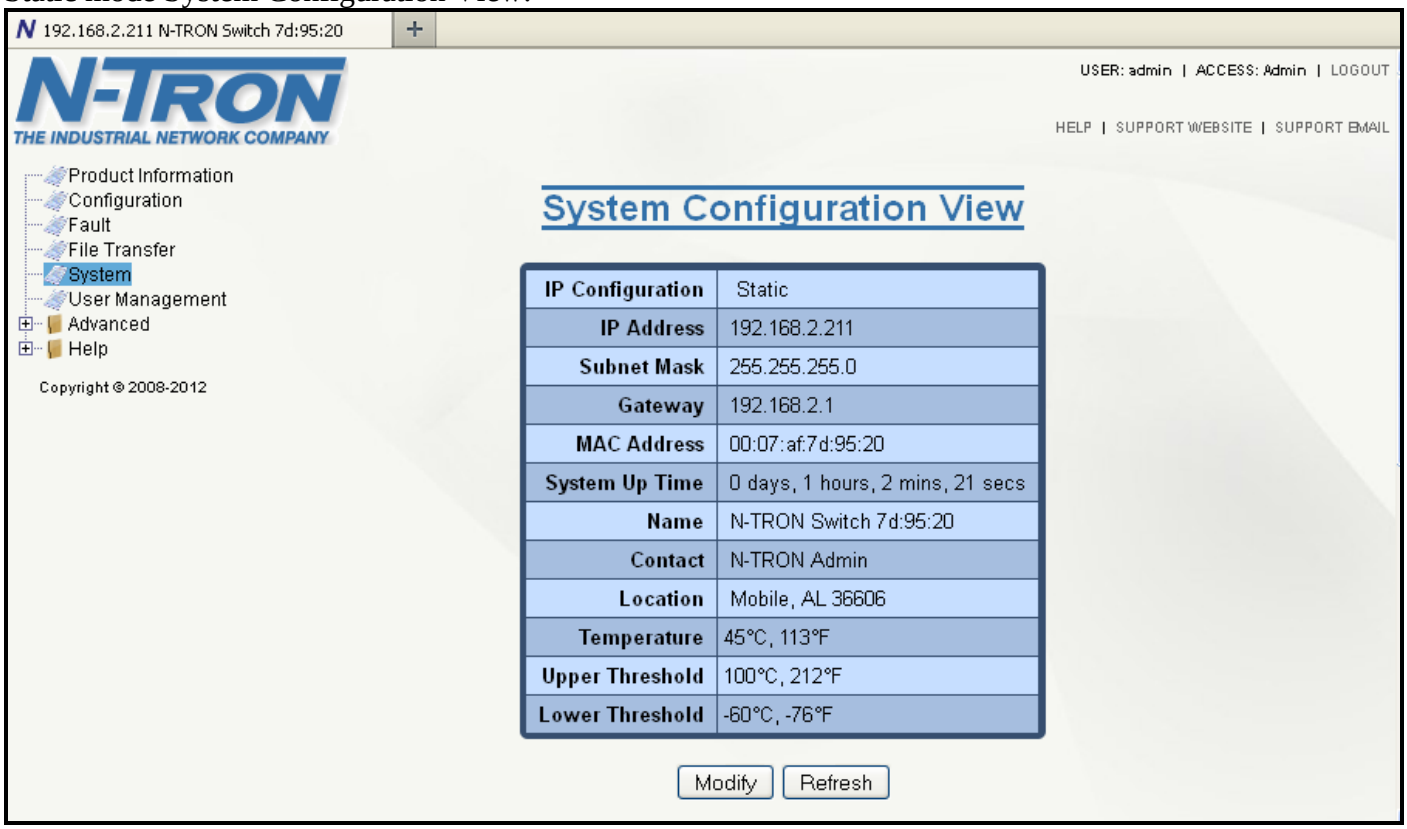
On “Export Saved Configuration from switch” pressing the “Configuration Settings” hyperlink brings up the Windows utilities to specify to just open it or where to save it and the filename.



System Page

The factory default is DCHP. Setting the IP Configuration to DHCP will use the Primary Management VLAN ports to receive an IP address from the DHCP Server. Changes to the Primary Management VLAN are made in the VLAN section. If no changes are made, the default VLAN will be used as the default Primary Management VLAN. The factory default fallback IP address is 192.168.1.201 if no DHCP is received.

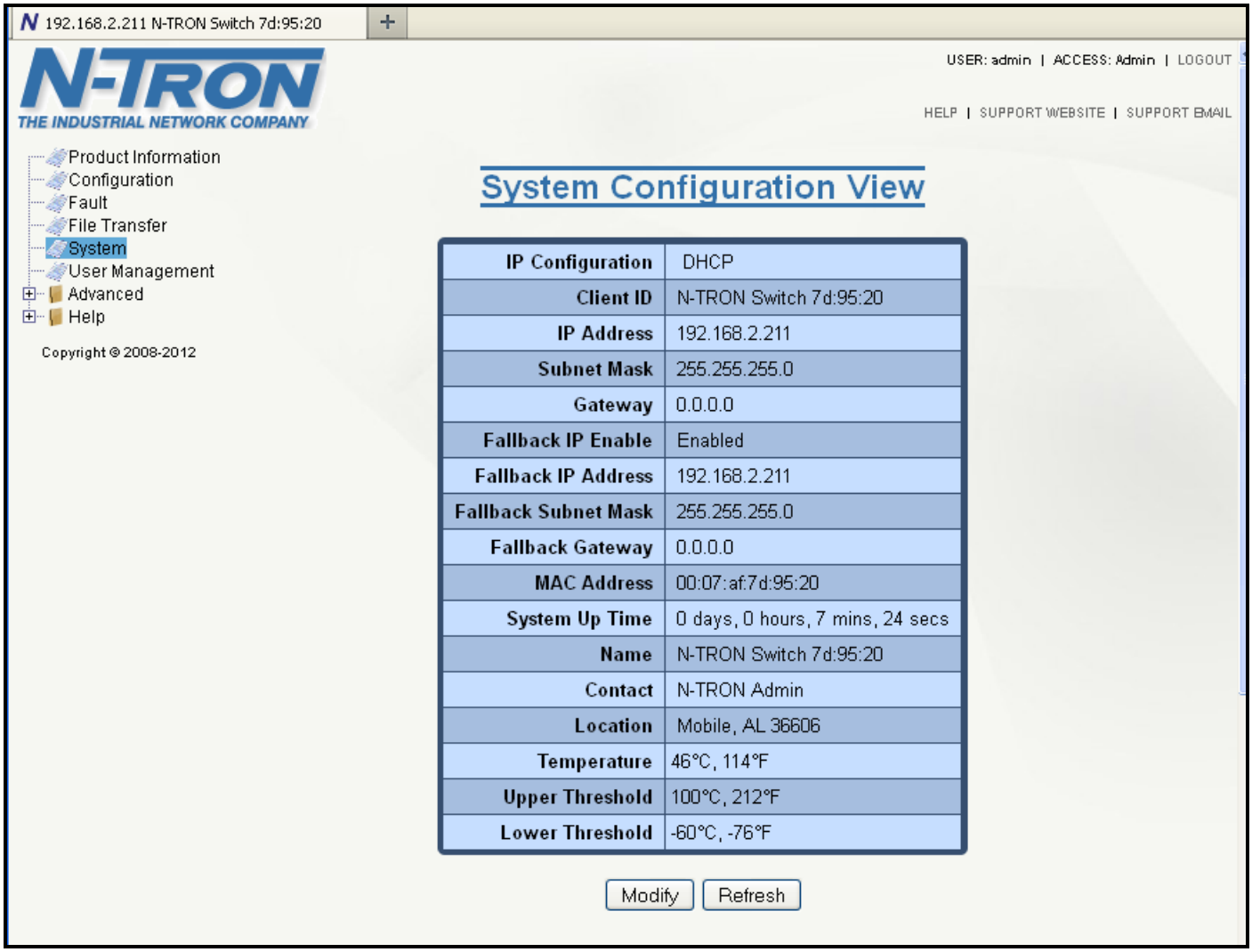
Static mode System Configuration View:



When the IP Configuration is in either DHCP or Static Mode:

IP Configuration: Method used to obtain an IP Address, Subnet Mask and Gateway Address
IP Address: Contains the current IP Address of the device.
Subnet Mask: Contains the current Subnet Mask of the device.
Gateway: Contains the current Gateway of the device.
MAC Address: MAC Address of the device.
System Up Time: This parameter represents the total time count. This time has elapsed since the switch was turned ON or RESET.
Name: It shows the name of the product, which allows alphanumeric and special characters (#, _, -) only.
Contact: The person to contact for system issues, which should be someone within your organization.
Location: The physical location of the switch.
Temperature:: The calculated ambient temperature near the switch. This calculation is only valid after a warm-up period.
Upper Threshold: The highest temperature for the switch without causing a fault to occur. The threshold is specified as an integer in C degrees. The range is from -60°C to 100°C, and the default is product dependent.
Lower Threshold: The lowest temperature for the switch without causing a fault to occur. The threshold is specified as an integer in C degrees. The range is from -60°C to 100°C, and the default is product dependent.

DHCP mode System Configuration View:



When the IP Configuration is in DHCP Mode the following information is added:

Client ID: Option used by DHCP clients to specify their unique identifier. The identifier may be the MAC address, switch name, or entered as a text string or hex characters.

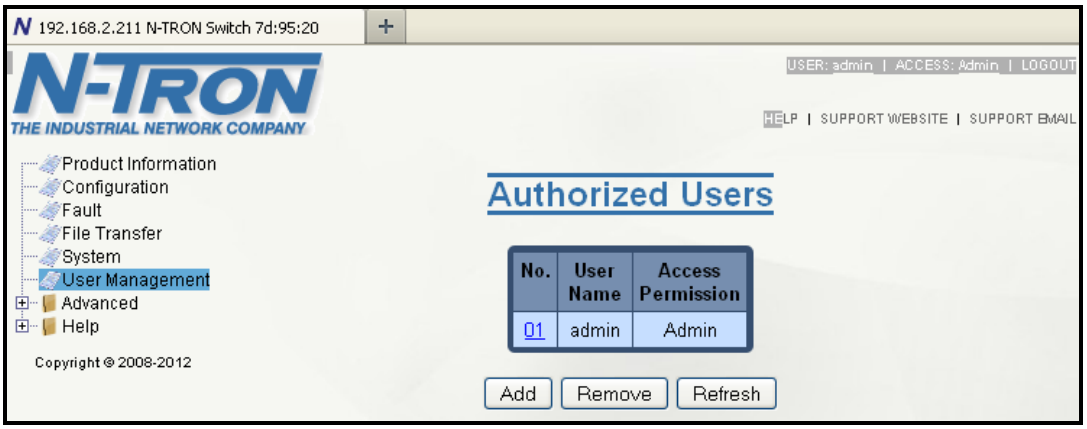
Fallback IP Address: Contains the configured Fallback IP Address of the device. The default is 192.168.1.201.

Fallback Subnet Mask: Contains the configured Fallback Subnet Mask of the device.

Fallback Gateway: Contains the configured Fallback Gateway of the device.

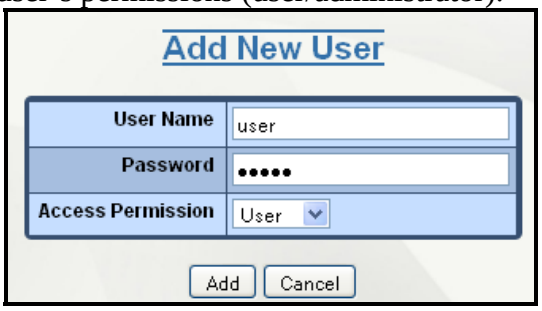
User Management

The User Management screen allows users to view, add, modify and remove system user accounts. The display includes a list of all the users who have access to the management features of the switch and their access permissions.



Adding Users

Following the Add button on the above example, the administrator can add another user and assign the user a username, a password, and the user's permissions (user/administrator).



User names may include all alphanumerical characters, "_" and "-" and must be 3 to 15 characters long. Passwords may include all printable characters except ":" and spaces and must be 3 to 15 characters long.

Admin permission gives the right to change and view any switch configuration and to change and view any current port settings.User level access permission gives the right to view switch configurations and to view current port settings, but cannot make any changes to these settings.

A page should display after the administrator clicks the Add button indicating that the user was successfully added.

Adding Users, Continued …

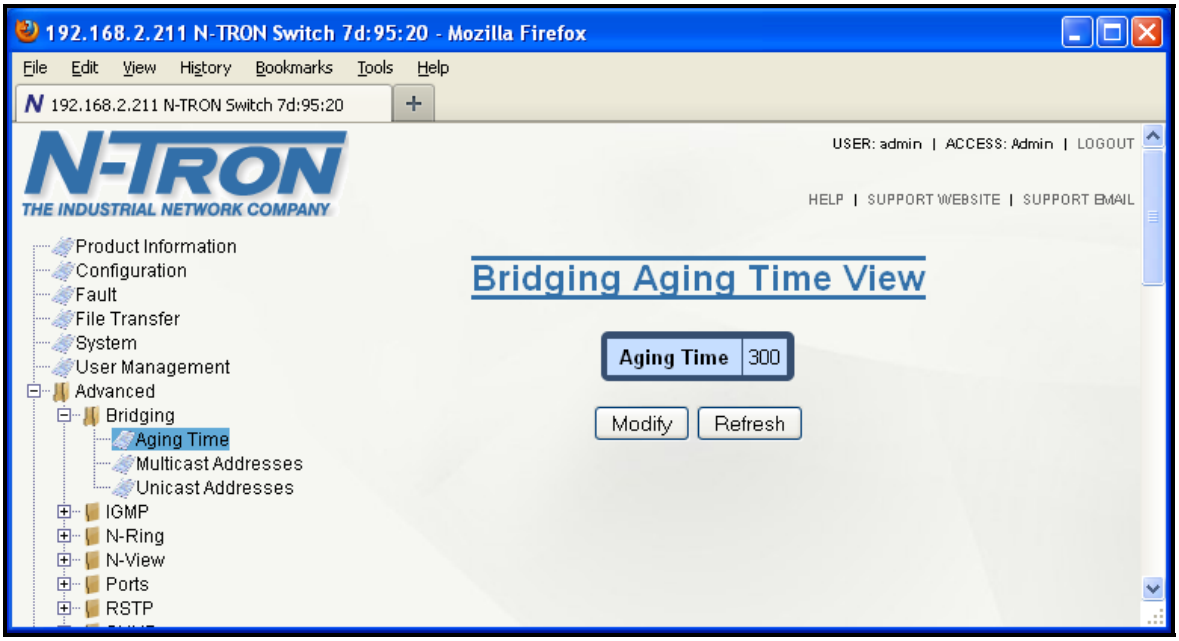
In order to remove a user, simply click on the Remove button at the bottom of the page.

Following the Remove button on the above example, the administrator can remove a user by entering in the user's name and clicking the Remove button.

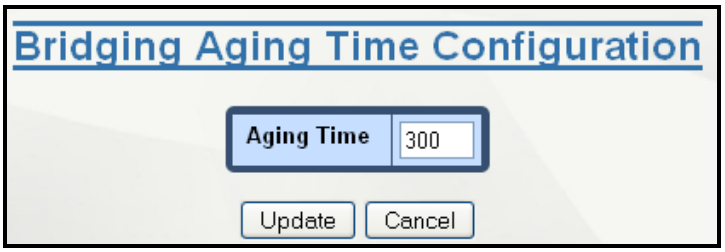
A page should follow indicating that the user was successfully removed from the list.

Bridging – Aging Time

The Aging Time tab under the Bridging category will display the currently configured Aging Time. This page allows users to modify this variable to meet their needs. This configurable field displays the desired aging time for dynamically learned MAC addresses. Inactive MAC addresses will be removed from the Hardware Address Entry Table after the aging time period has expired. The internal aging time period will be between 1 and 2 times the selected aging time value. The selected aging time value range is 10-630 seconds. The default aging time is 300 seconds.

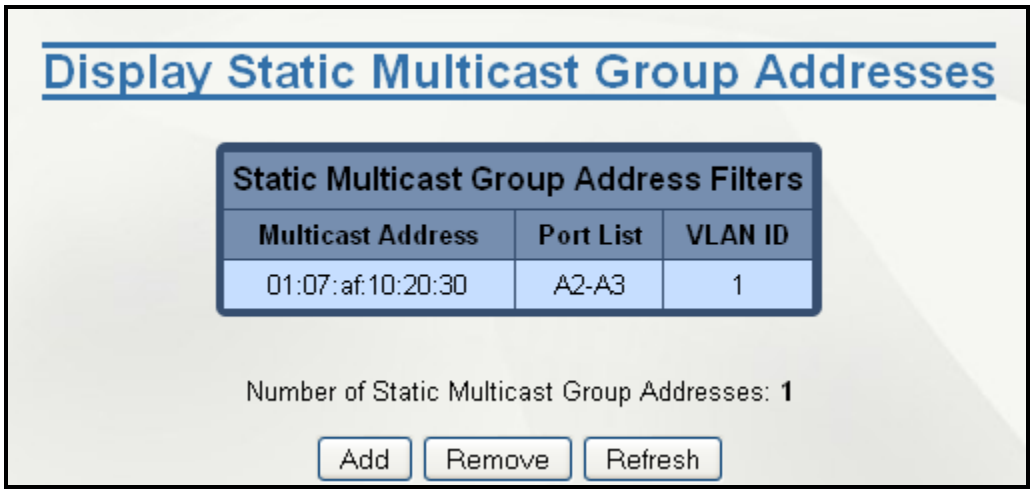


After selecting the Modify button, the user will be presented with a page that allows the number to be entered and updated.

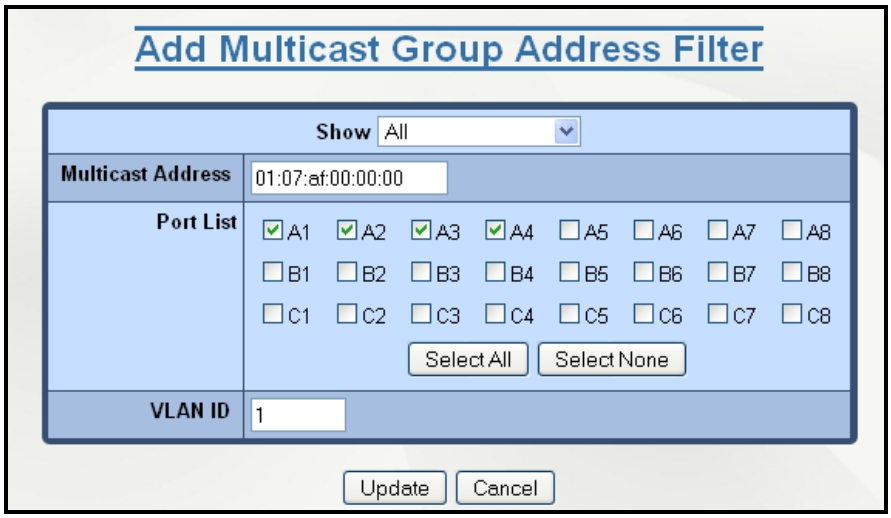


Bridging – Multicast Addresses

The Multicast Addresses tab under the Bridging category will display a list of Multicast Group Addresses that are associated with respective port numbers. This may be used to statically assign a Multicast Group Address access to a group of ports on the switch.



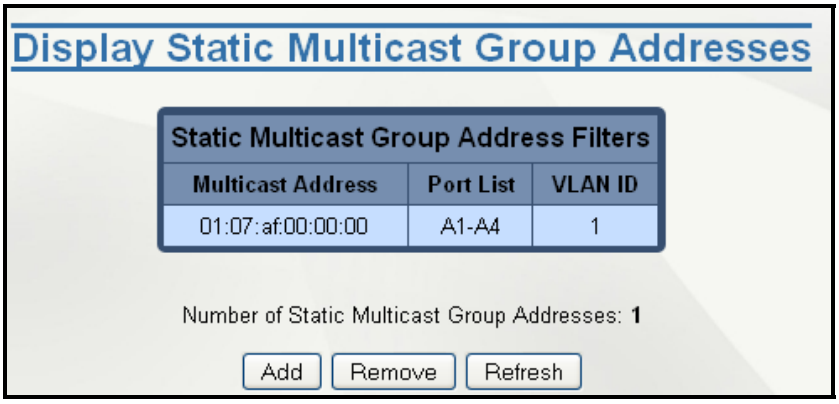
Following the Add button on the page above, the administrator must enter a valid Multicast Group Address and associate it with a port number or list on the switch. Once the administrator clicks on the Add button, the changes will take effect instantly.



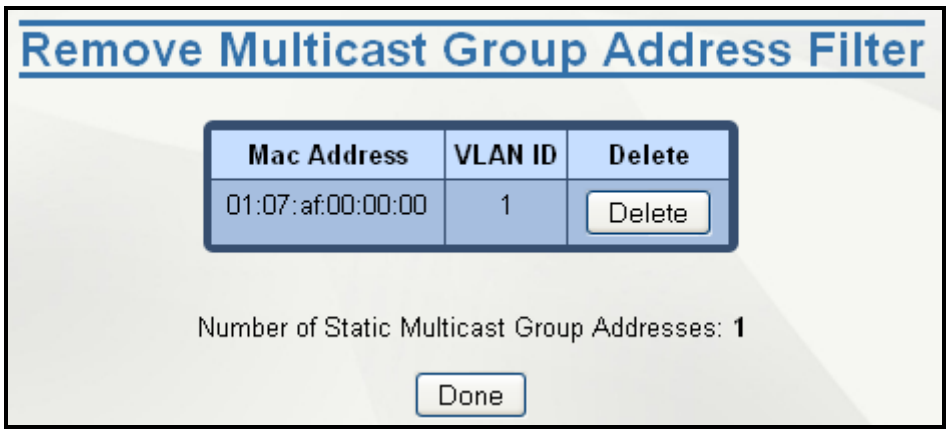
Note: *If there are multiple ports on different VLANs, the NT24k will apply the static multicast address to the lowest VLAN-ID that is associated with one of the ports assigned to the static multicast address. So if the lowest VLAN-ID contains all the ports assigned to the static multicast address (an umbrella VLAN), it will function for all those ports with no problems. This can be achieved with overlapping VLANs.*

Bridging – Multicast Addresses Continued…

After adding a Multicast Group Address, it will appear on the main list and will show the associated ports that go along with that address.

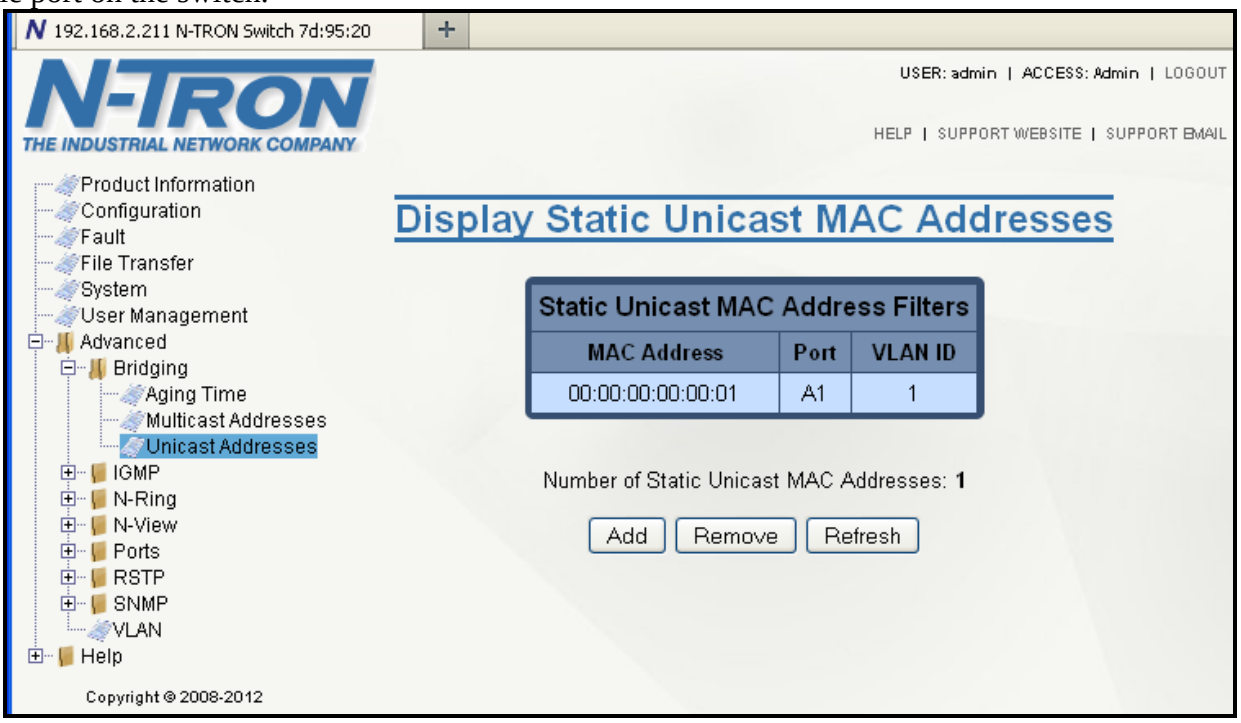


Following the Remove button on the example above, the administrator will be presented with a list of Multicast Group Addresses that are configured on the switch. Using the pull-down menu, the administrator should select the desired address to be removed. Then click on the Remove button at the bottom of the page.

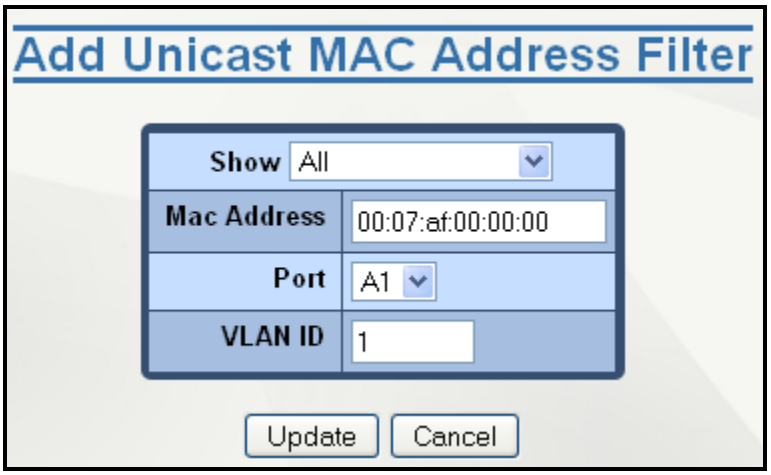


Bridging – Unicast Addresses

The Unicast Addresses tab under the Bridging category will display a list of MAC addresses that are associated with each respective port number. This can be used to statically assign a MAC address access to a single port on the switch.

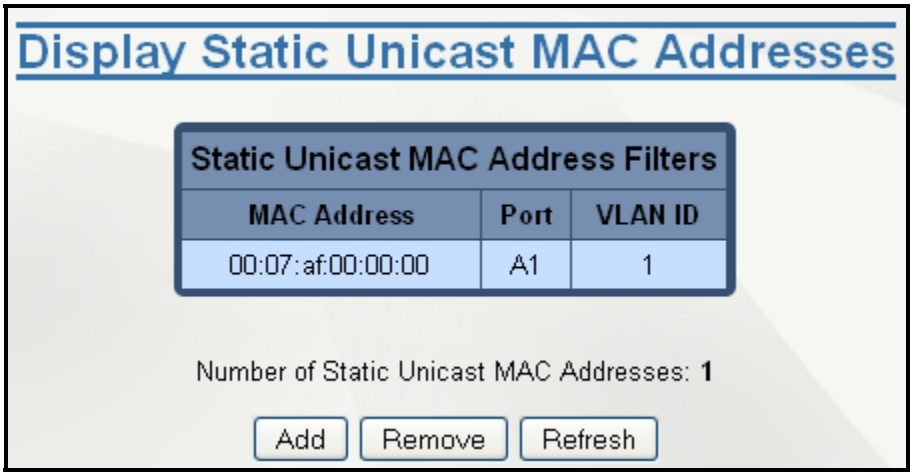


Following the Add button on the page above, the administrator must enter a valid MAC address and associate it with a port number on the switch. Once the administrator hits the Add button, the changes will take effect instantly.

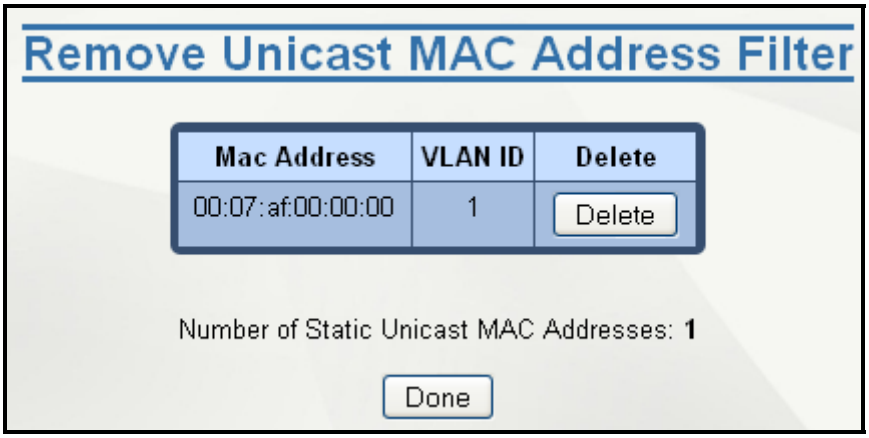


Bridging – Unicast Addresses, Continued…

Once a staic MAC address has been added, it will be displayed in a list on the main page under the Unicast Addresses tab.

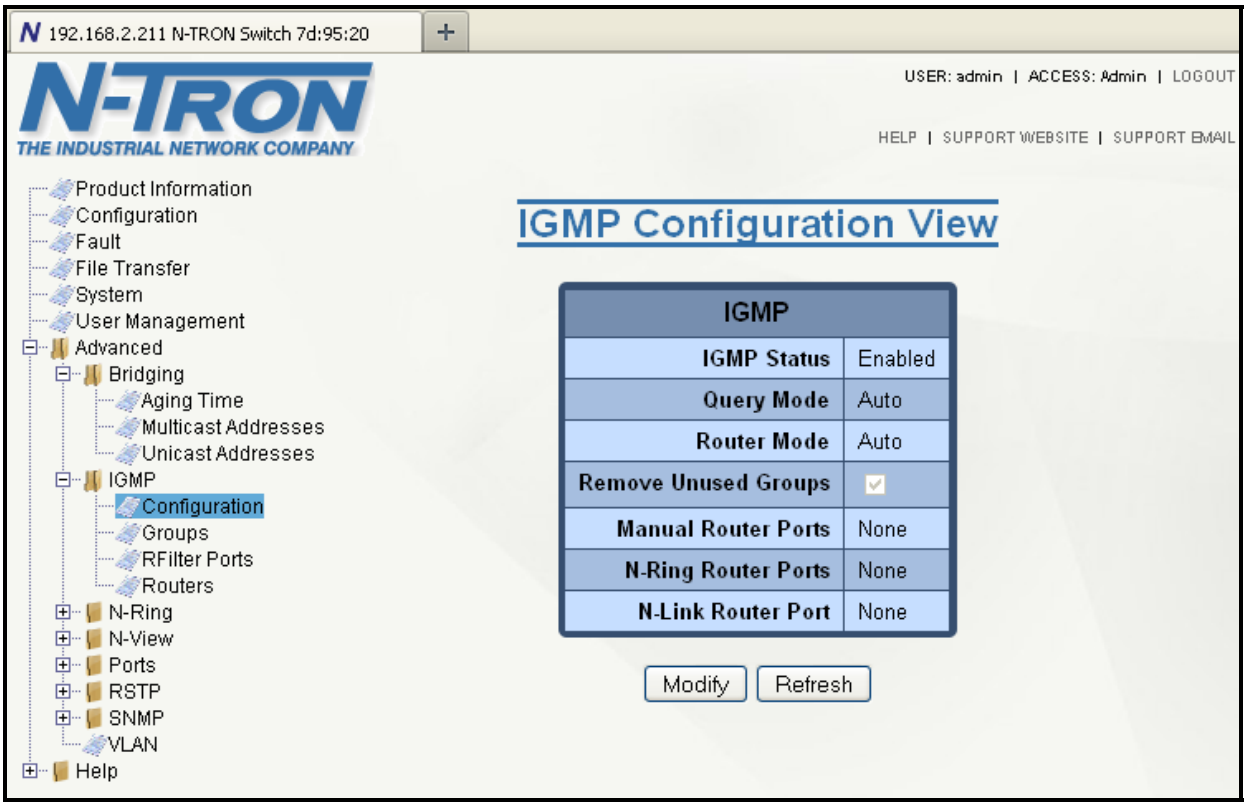


Following the Remove button on the example above, an administrator can delete a static MAC address from the list by pressing the Delete button on the page to remove the entry

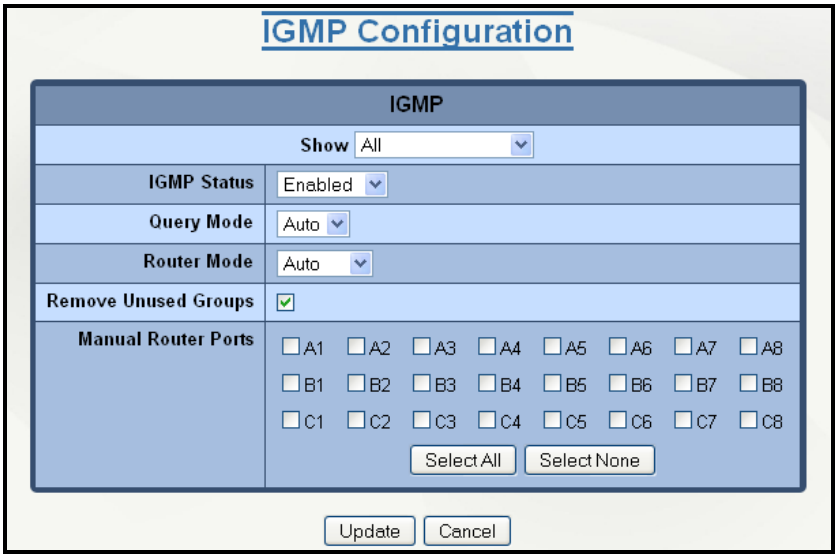


IGMP – Configuration

The Configuration tab under the IGMP category will display the IGMP basic configuration settings. By default, IGMP is enabled.

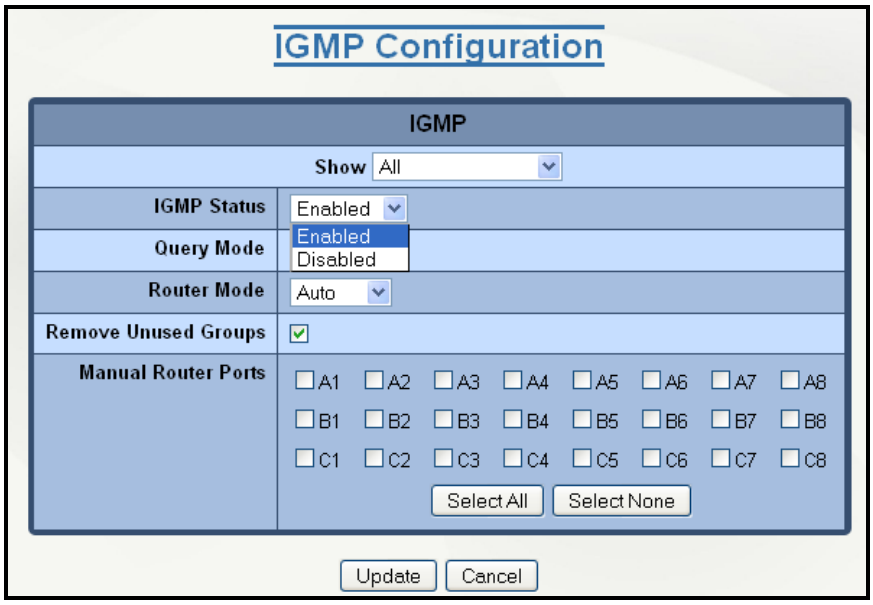


Following the Modify button, the administrator will see a list of configurable fields for the IGMP configuration. Once these fields are filled in to meet the needs of the administrator's network, the changes may be updated by clicking the Update button at the bottom of the page.

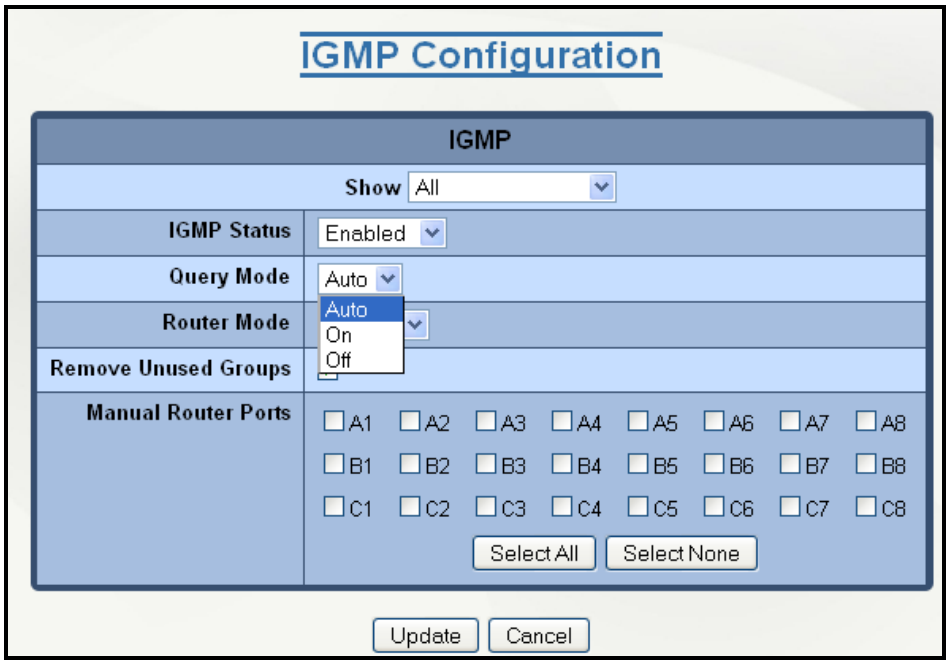


IGMP – Configuration, Continued…

The IGMP Status pull-down allows the user to enable or disable IGMP completely.

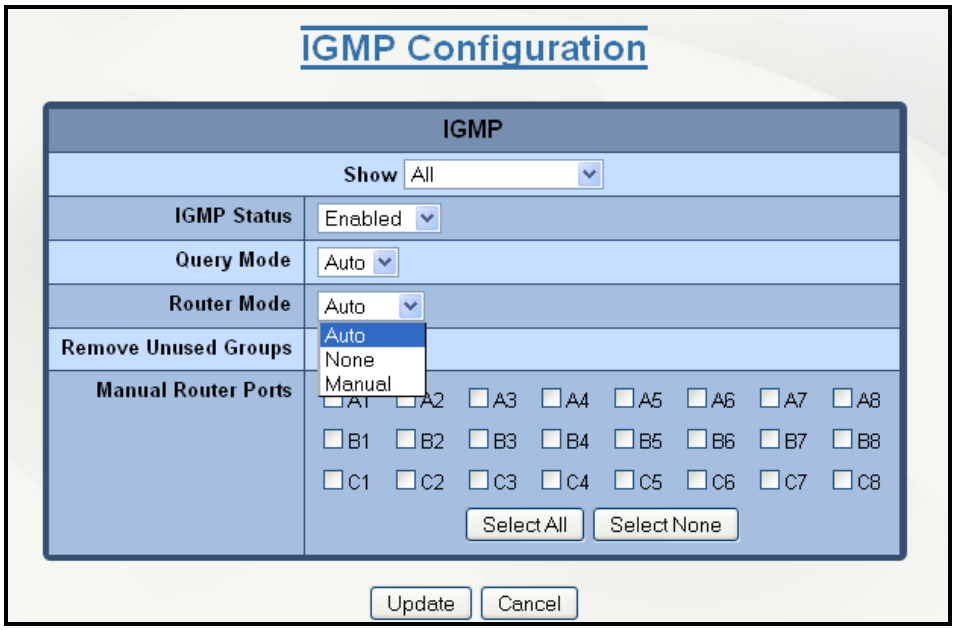


The Query Mode pull-down allows the user to set query mode for Automatic (the default), On (always), or Off (never). In Automatic multiple switches will ensure that only one switch is the active querier.

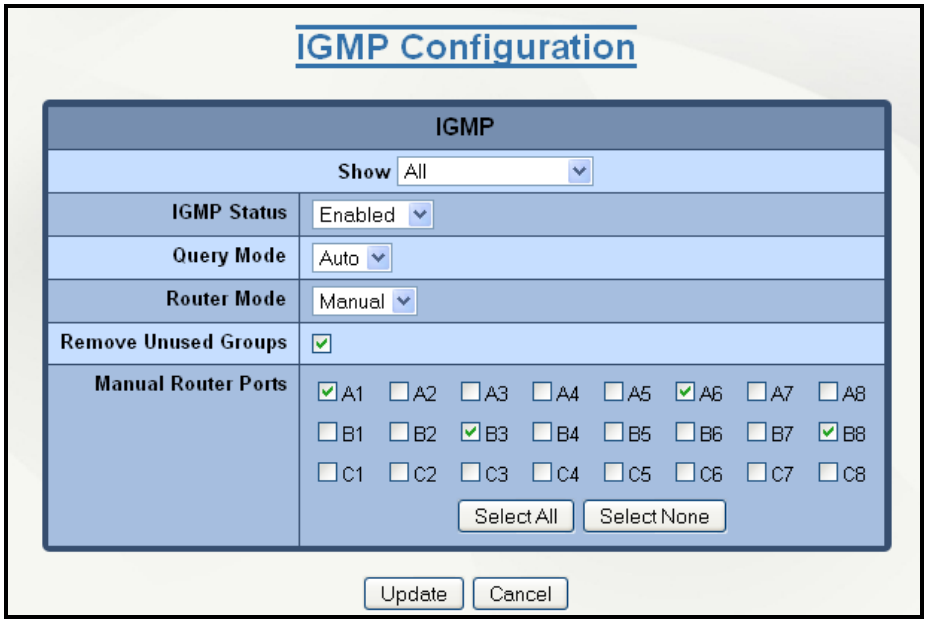


IGMP – Configuration, Continued…

The Router Mode pull-down allows the user to choose router mode. 'Auto' allows for dynamically detected and manually set router ports. 'Manual' allows only for manually set router ports. 'None' allows no router ports. On an N-Ring Manager, the ring ports are informatively shown as router ports.

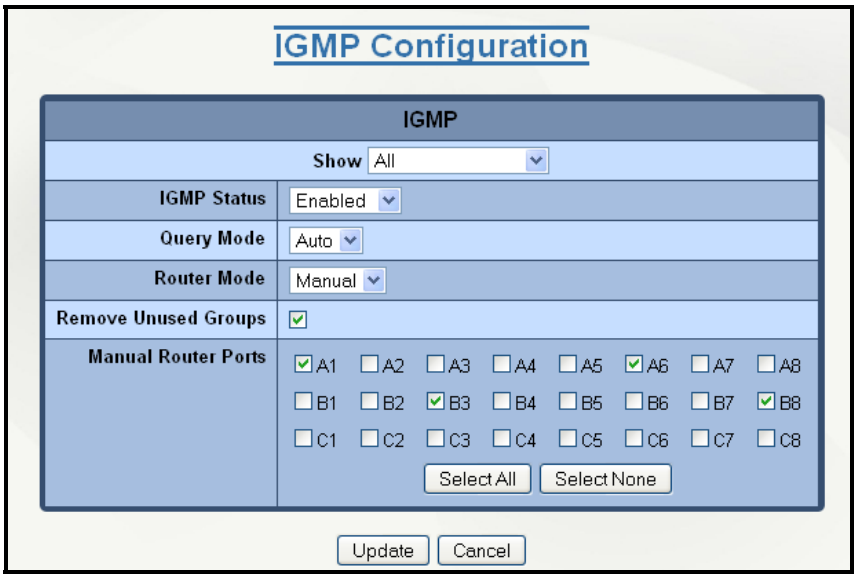


The user can specify the manual router ports:



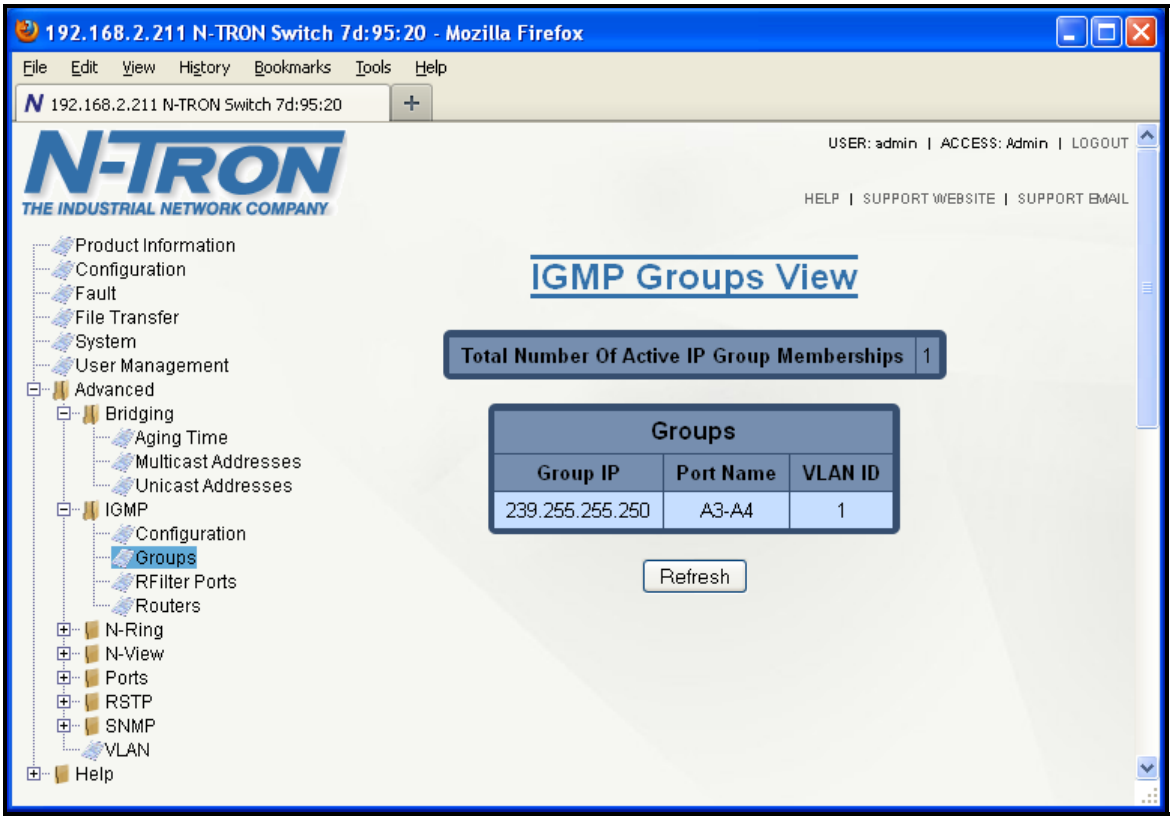
IGMP – Configuration, Continued…

If **Remove Unused Groups** is checked then unused IGMP Groups will be removed and traffic with those multicast addresses will be treated as normal multicast. If unchecked, then unused IGMP Groups are not removed and traffic with those multicast addresses will be limited. The default is checked. Note that IGMP Groups are not retained through a power cycle.



IGMP – Groups

The Groups tab under the IGMP category will display a list of IGMP groups based on the Group IP and the port that it is associated with.



Total Number of Active IP Group Memberships: Total Number of Active Group IP Memberships based on the dotted quad (aaa.bbb.ccc.ddd) view and counting each joined port.

Group IP: Dynamically created Multicast group IP address.

Port Name: The descriptive name of the port.

VLAN ID: VLAN in which the Group IP is assigned. The range is 1-4094.

IGMP – RFilter Ports

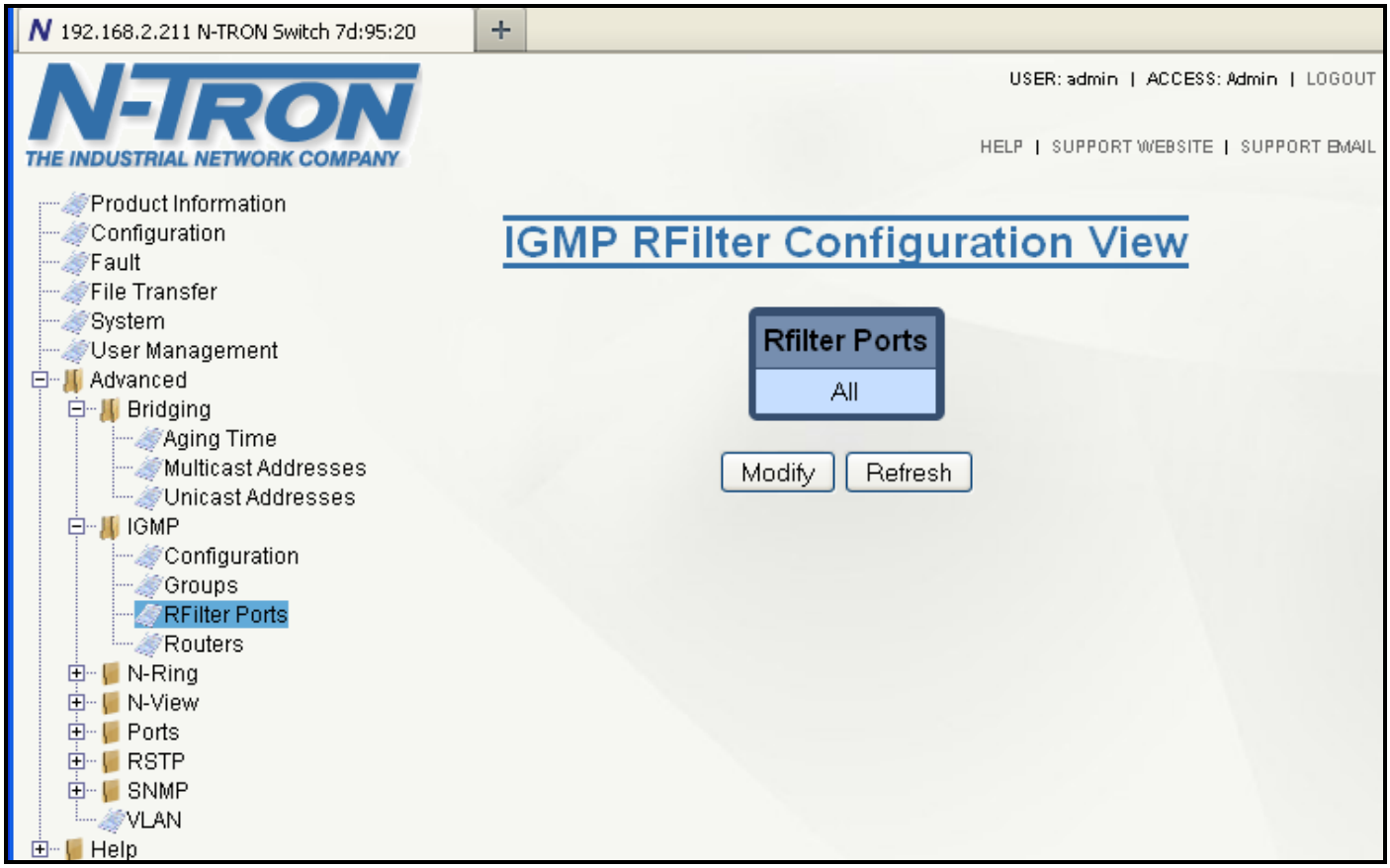
The ‘rfilter’ (**Router Multicast Data Filter**) function allows you to choose whether or not DATA frames with KNOWN group multicast addresses are sent to the ‘router’ ports (links to other switches). Control packets (Join, Leave) will be sent to the router(s) regardless of this setting. “KNOWN” is known from dynamic IGMP Snooping operations. If IGMP is enabled and a port is a 'router port', then RFilter enabled stops IGMP group data from egressing on the port unless a join to that specific IGMP group has come into the port. IGMP controls (Join, Leave, Query) are still sent.

The factory default is that the Router Multicast Data Filter is enabled for all ports, so any router ports do NOT get DATA frames with KNOWN multicast destination addresses unless a join to a specific multicast address has been received on that port. **Joins override an rfilter.**

If rfilter is disabled, router ports do get DATA frames with KNOWN multicast destination addresses

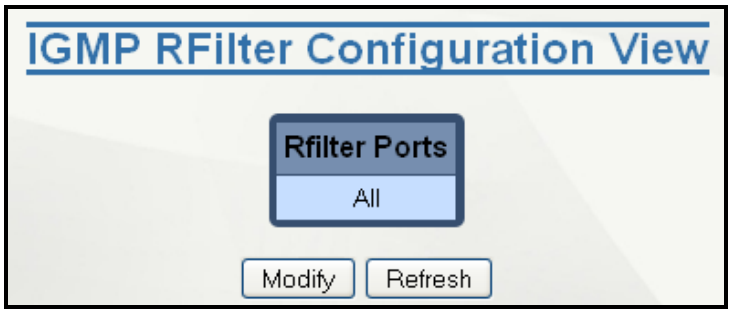
Rfilter can be set for individual ports: any, all, or none. For each port, rfilter will have an impact only if that port is manually or dynamically chosen as a router port.

Default configuration:

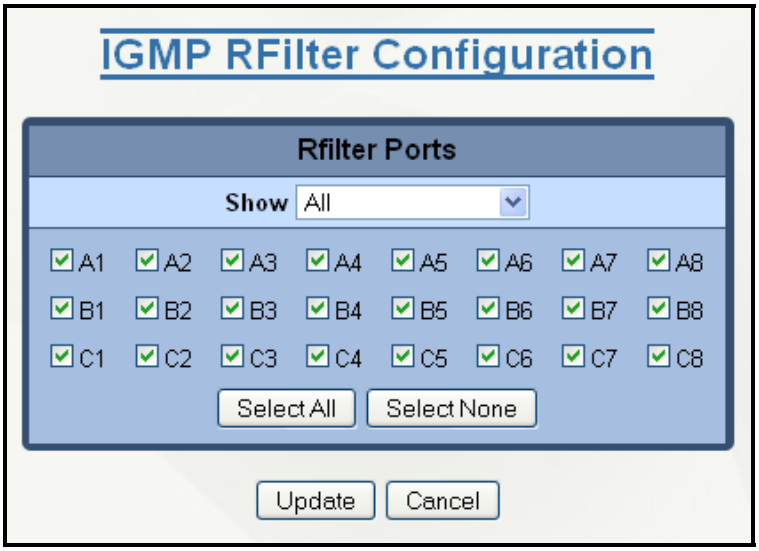


IGMP – RFilter, Continued…

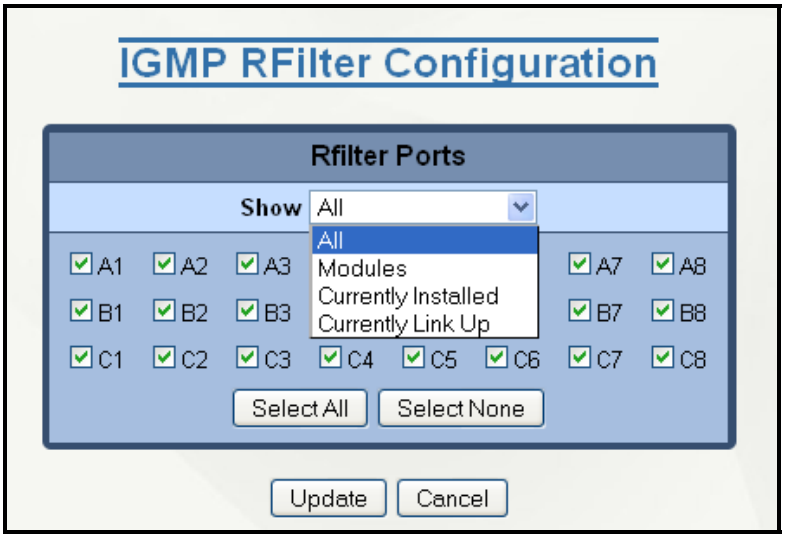
Modifying rfilter port settings:



After pressing ‘Modify’, the administrator can select which ports to identify as RFilter ports or choose all ports.

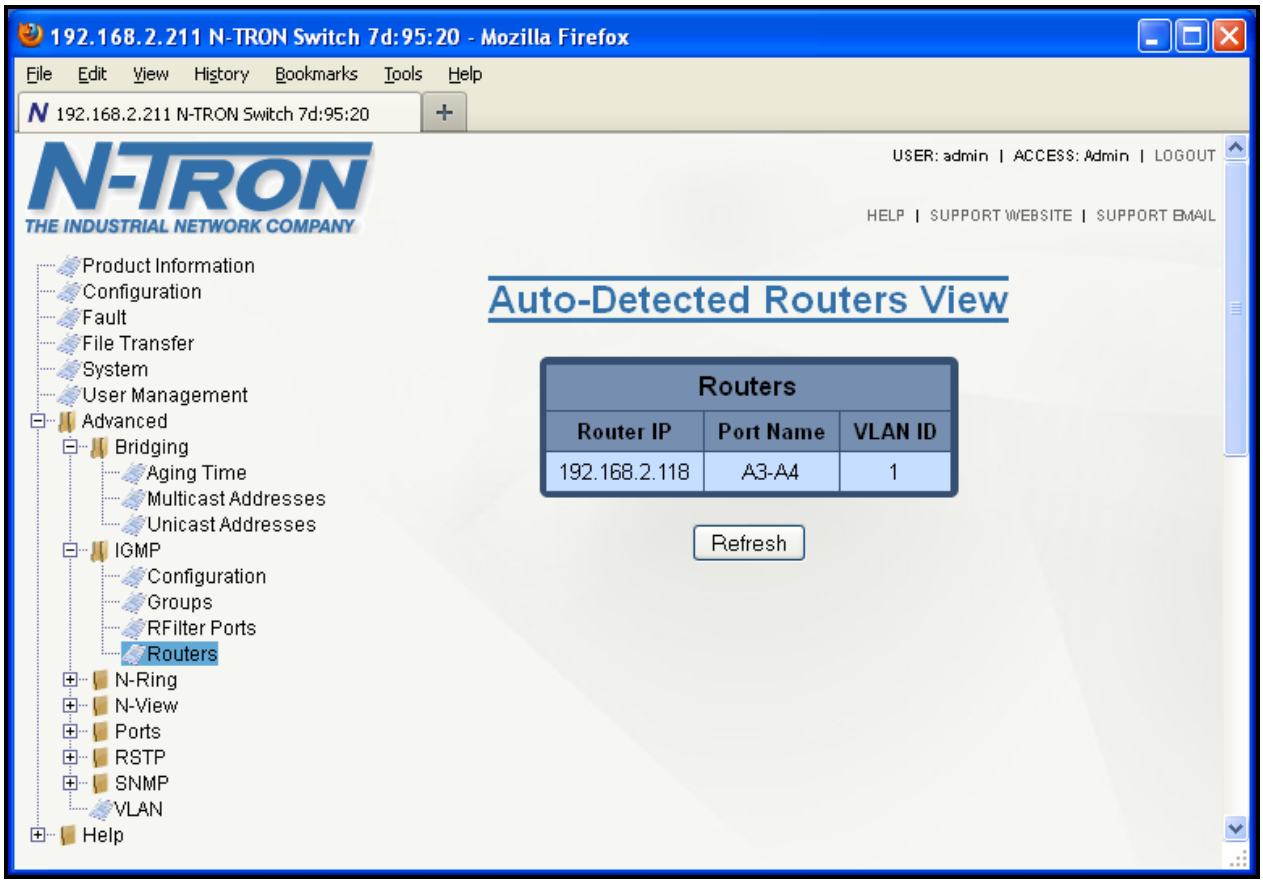


The administrator can view all possible ports (‘Modules’), currently installed ports, or currently linked up ports:



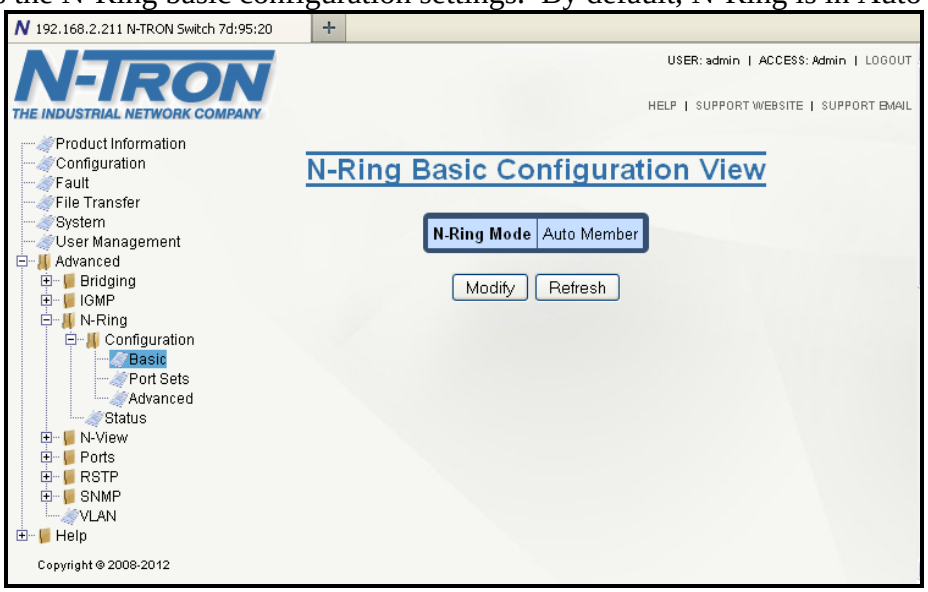
IGMP – Routers

The Routers tab under the IGMP category will display a list of Auto-detected Router IPs and the port numbers that they are associated with. The Router IP address is auto-detected.

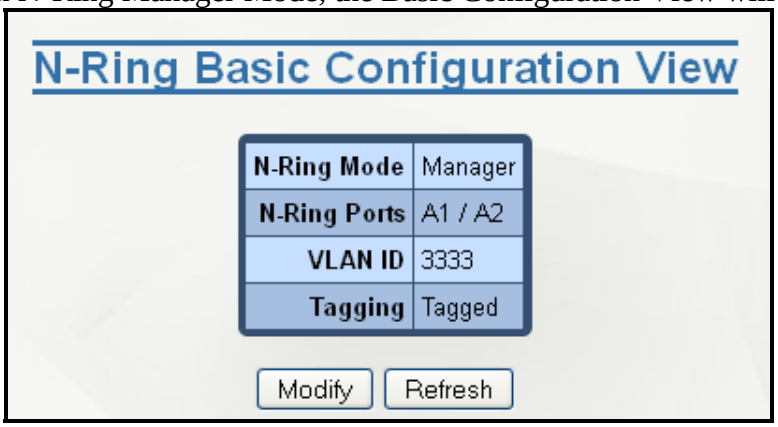


N-Ring – Configuration - Basic

This page displays the N-Ring basic configuration settings. By default, N-Ring is in Auto Member mode.



If in N-Ring Manager Mode, the Basic Configuration View will be:



Notes:

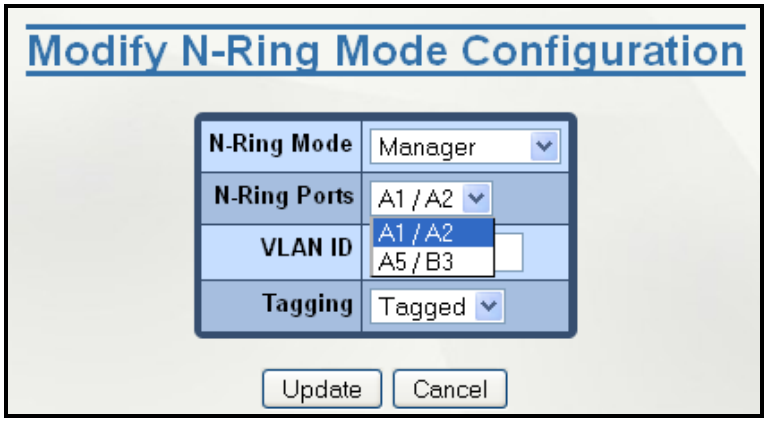
1. Only tagged N-Ring is supported. That is best for frame priority reasons.
2. Do not create redundant links unless either RSTP or N-Ring is enabled.
3. The Default VLAN and any active N-Ring VLAN cannot be deleted.
4. N-Ring Manager cannot have RSTP enabled on the N_Ring ports. N-Ring Manager will disable RSTP on the N-Ring ports if necessary. Other ports may have RSTP enabled.
5. RSTP & N-Ring are different modes and cannot share links or segments. If a port is both an RSTP port and an active N-Ring port, then the port will be disabled for RSTP.
6. Do not connect the N-Ring to actively Trunking ports on an Auto Member.
7. Do not create redundant links unless either RSTP or N-Ring is enabled.
8. Any one NT24k can only participate in one N-Ring.
9. Since VLANs are implemented for security reasons as well as traffic flow, N-Ring only makes minimal changes. It is up to the administrator to ensure that VLANs are configured correctly on the N-Ring manager and all N-Ring members.

N-Ring – Configuration – Basic, Continued …

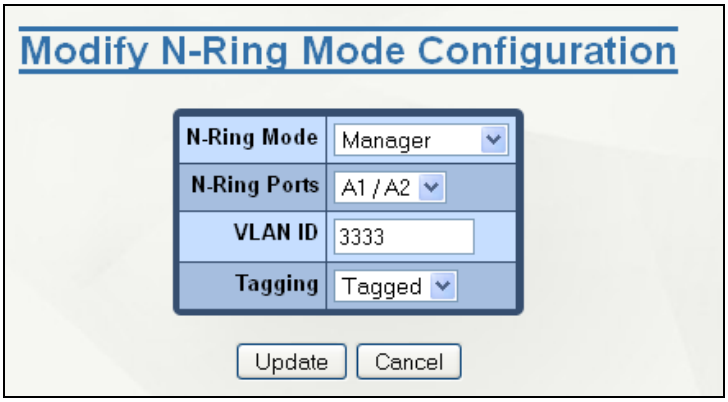
If N-Ring is disabled, the Basic Configuration View will be:

Following the Modify button on the above example, the administrator will see a pulldown of configurable choices for the N-Ring configuration, as below.

If N-Ring Mode is “Manager”, then a pull-down allows selection of available ports (in this case A1/A2, and A5/B3) as N-Ring ports.

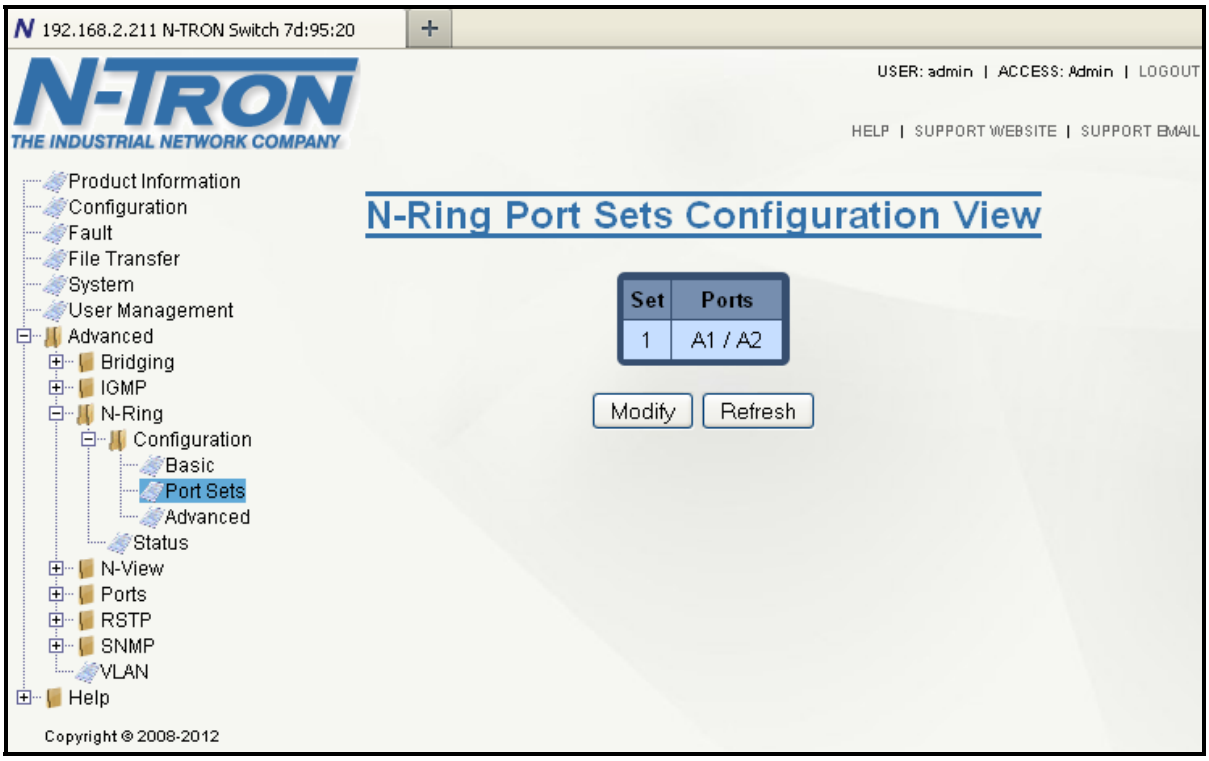


If N-Ring Mode is “Manager”, then VLAN ID can be set to a unique VLAN id (1 ~ 4094). Default is 3333.



N-Ring – Configuration – Port Sets

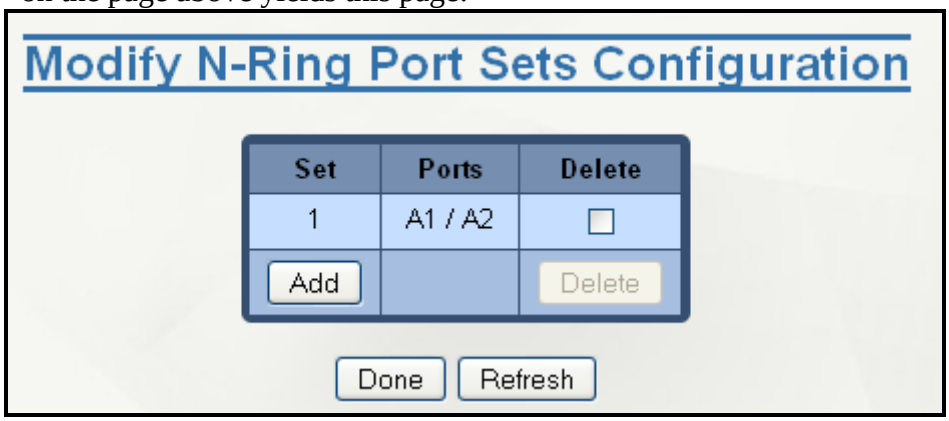
A port set is a group of two ports that may be used for an N-Ring. The default N-Ring Port Set is as shown, if available. In any event it is the lowest two installed ports.



Set: Port set table index.

Ports: Designated pair of N-Ring ports. To reassign different pairs, the port sets containing those ports, if any, must first be deleted before the ports can be reassigned (a port can only belong to one port set).

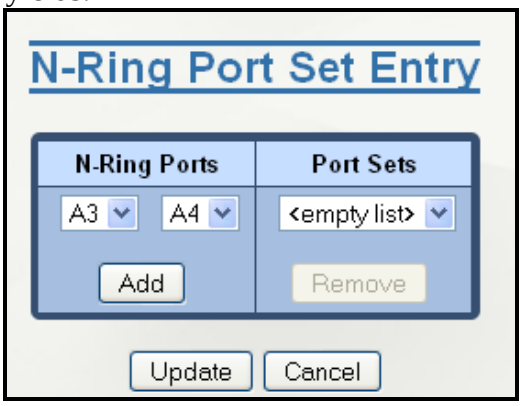
Pressing ‘Modify’ on the page above yields this page:



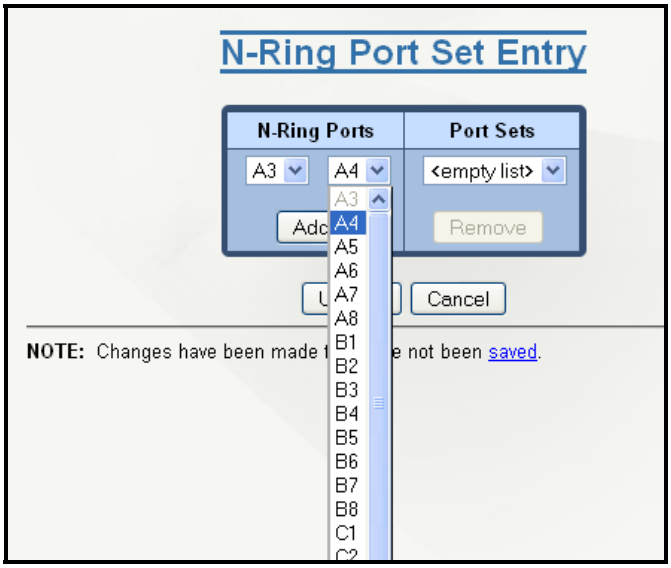
To delete a port set, click the checkbox in the desired row and then click the Delete button.

N-Ring – Configuration – Port Sets, Continued …

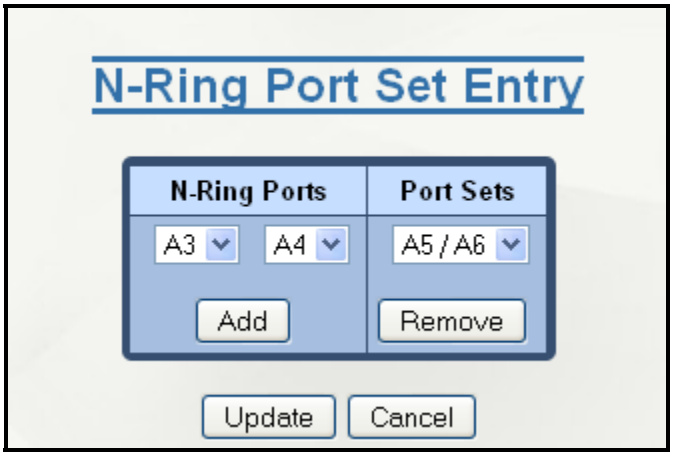
Pressing ‘Add’ on the page above yields:



The N-Ring ports can be selected by pulldown.

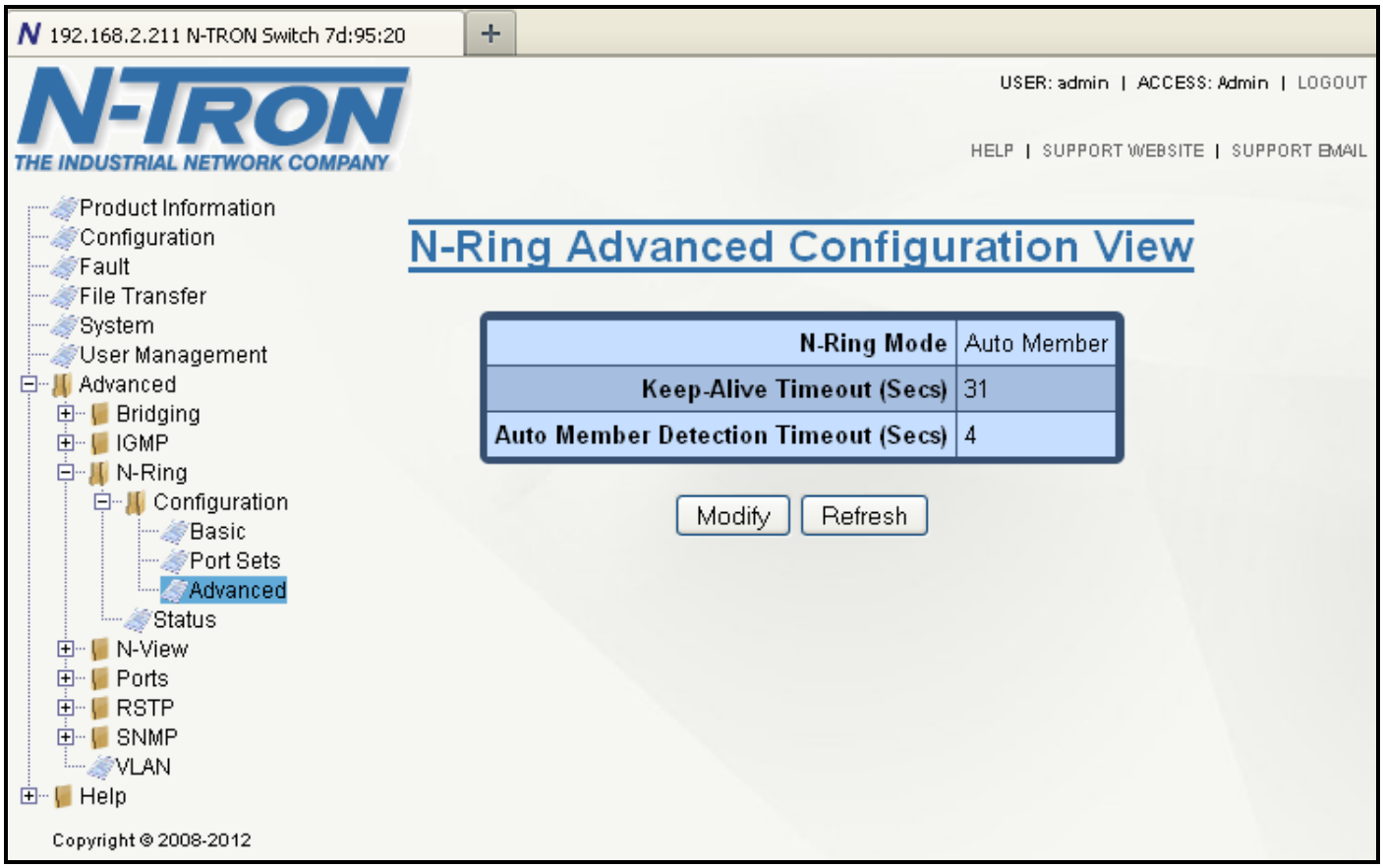


In this mode port sets can be deleted from a pulldown.



N-Ring – Configuration – Advanced

In factory defaults the N-Ring mode is Auto Member and the page looks like this:

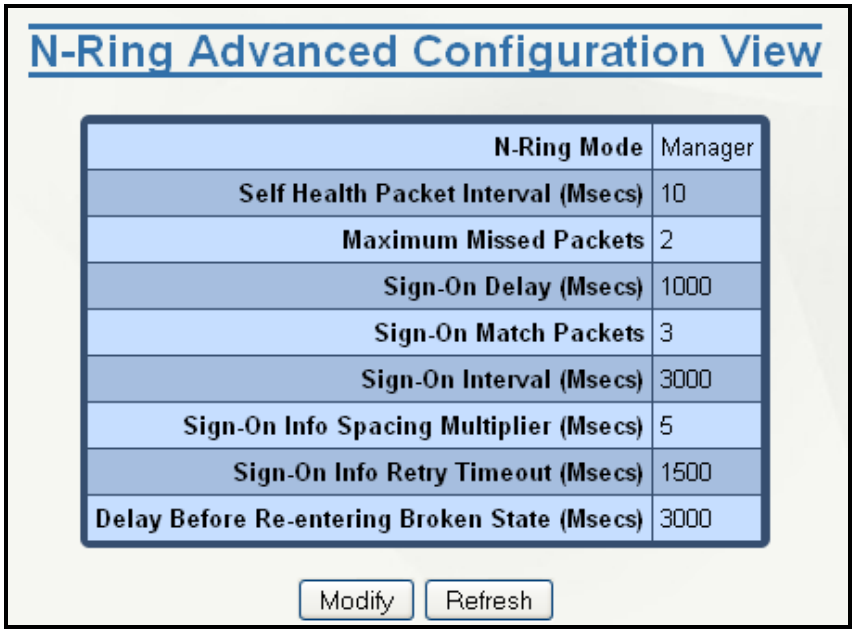


Keep-Alive Timeout: The amount of time to wait in seconds to receive a keep-alive request before switching from active member back to auto member. The default is 31. The range is 15 to 300 seconds, with an entry of zero disabling the feature.

Auto Member Detection Timeout: The amount of time to wait in seconds to receive N-Ring frames on any auto member port (at boot up) before assuming the switch is not part of an N-Ring.

N-Ring – Configuration – Advanced, Continued …

When the N-Ring mode is Manager, the Advanced Configuration page looks like this:

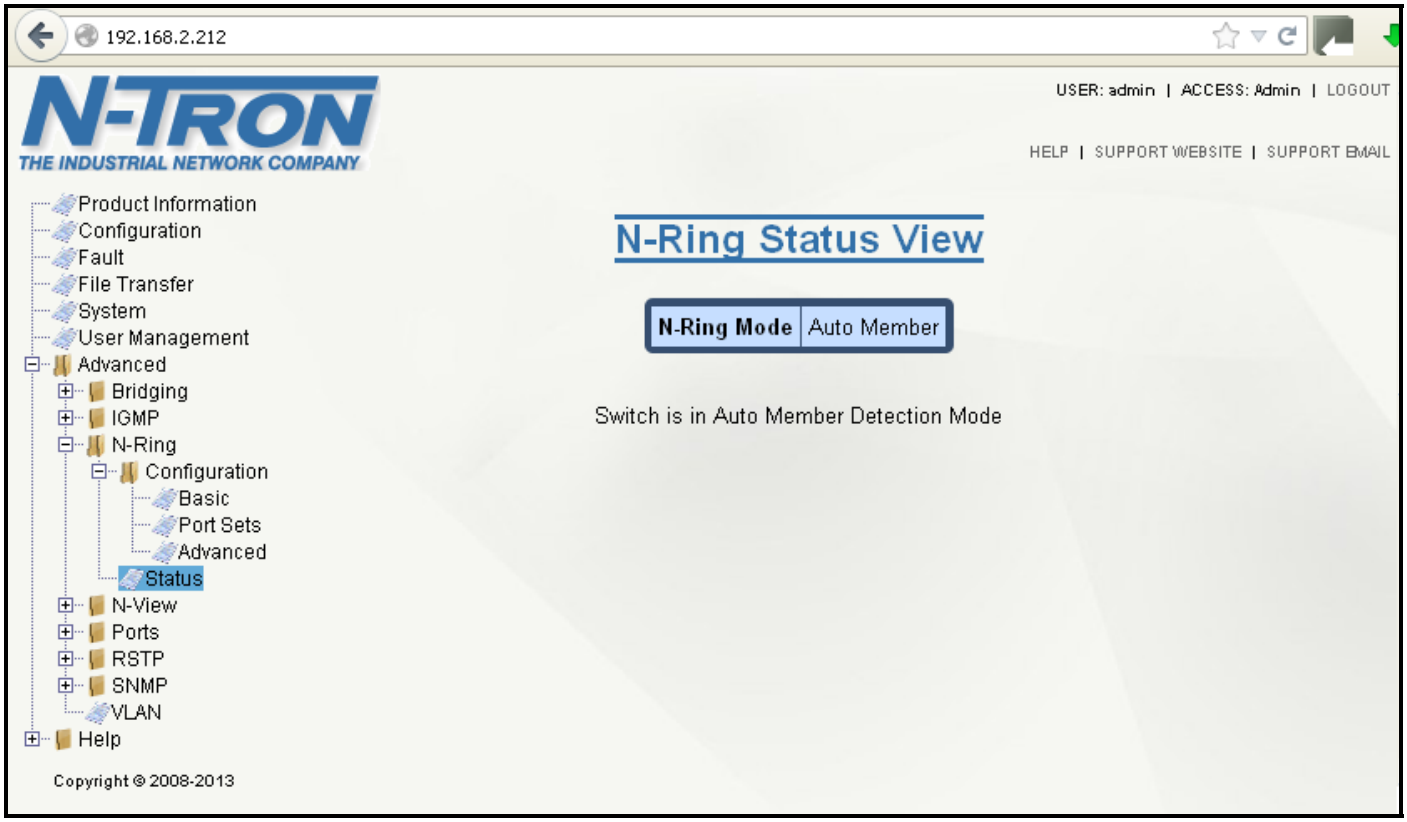


If N-Ring mode is Manager, the following advanced configuration data will be shown:

Self Health Packet Interval:	The amount of time to wait in milliseconds before sending Self-Health packets. The default is 10.
Maximum Missed Packets:	The number of consecutive missed Self-Health packets that constitute a fault. The default is 2.
Sign-On Delay:	The amount of time to wait in milliseconds before requesting initial sign-on information from ring members. The default is 1000.
Sign-On Match Packets:	The number of times the switch count must match before starting the sign-on process. The default is 3.
Sign-On Interval:	The interval of time to wait in milliseconds before requesting subsequent sign-on information from ring members when the ring is broken. The default is 3000.
Sign-On Info: Spacing Multiplier:	The amount of time to wait in milliseconds, scaled by switch number, before sending information to the ring manager. The default is 5.
Sign-On Info Retry Timeout:	The amount of time the ring member will wait in milliseconds for the ring manager to acknowledge receipt of the member's information before the member tries to re-send the information. The default is 1500.
Delay Before Re-Entering Broken State:	The amount of time, in milliseconds, that must elapse before the ring is allowed to go back into the broken state. The default is 3000.

N-Ring – Status

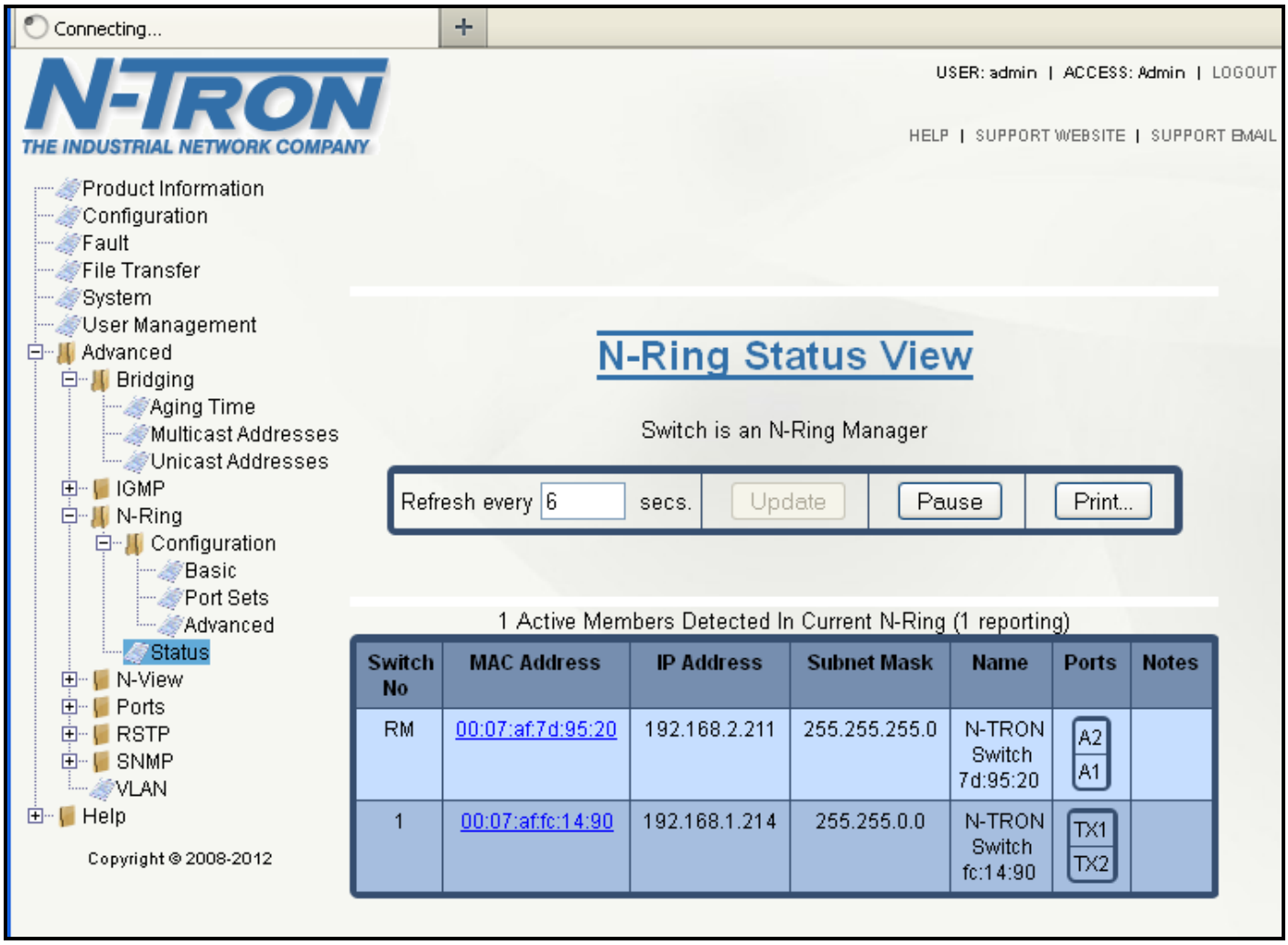
If N-Ring mode is inactive Auto Member, the following data will be shown:



If N-Ring mode is Active Auto Member, the following data will be shown:

N-Ring – Status, Continued …

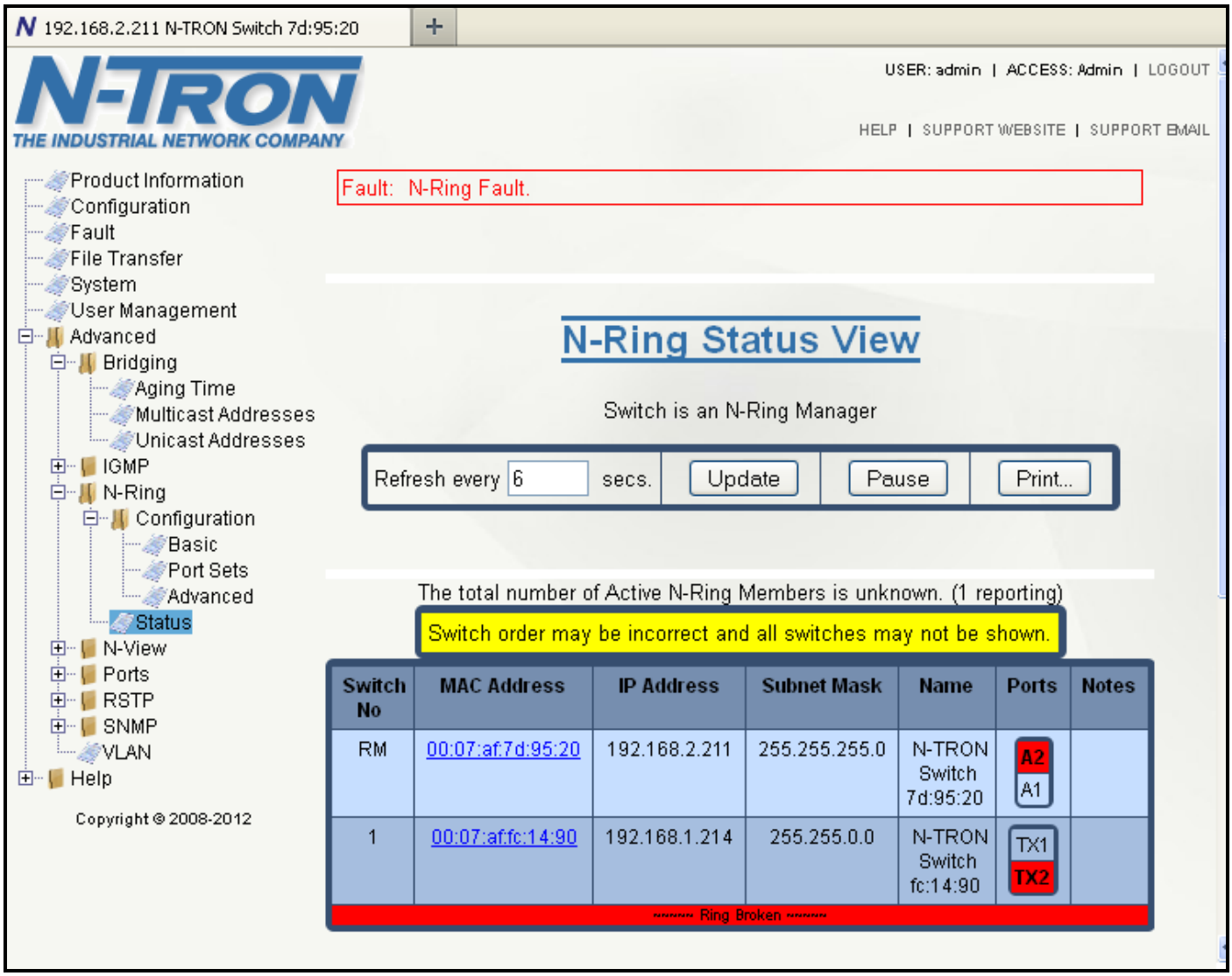
If N-Ring mode is Manager, the following data will be shown. If the MAC is selected, more data will be retrieved and shown about the switch.



Switch No.: The number of the switch in the N-Ring. (RM=Ring Manager)
MAC Address: The MAC Address of the switch.
IP Address: The IP Address of the switch.
Subnet Mask: The Subnet Mask of the switch.
Name: The name of the switch. (Set on the switch)
Ports: The N-Ring ports of the switch.
Notes: Information regarding the switch.

N-Ring – Status, Continued …

On an N-Ring Manager Status for a faulted N-Ring, the below is presented:



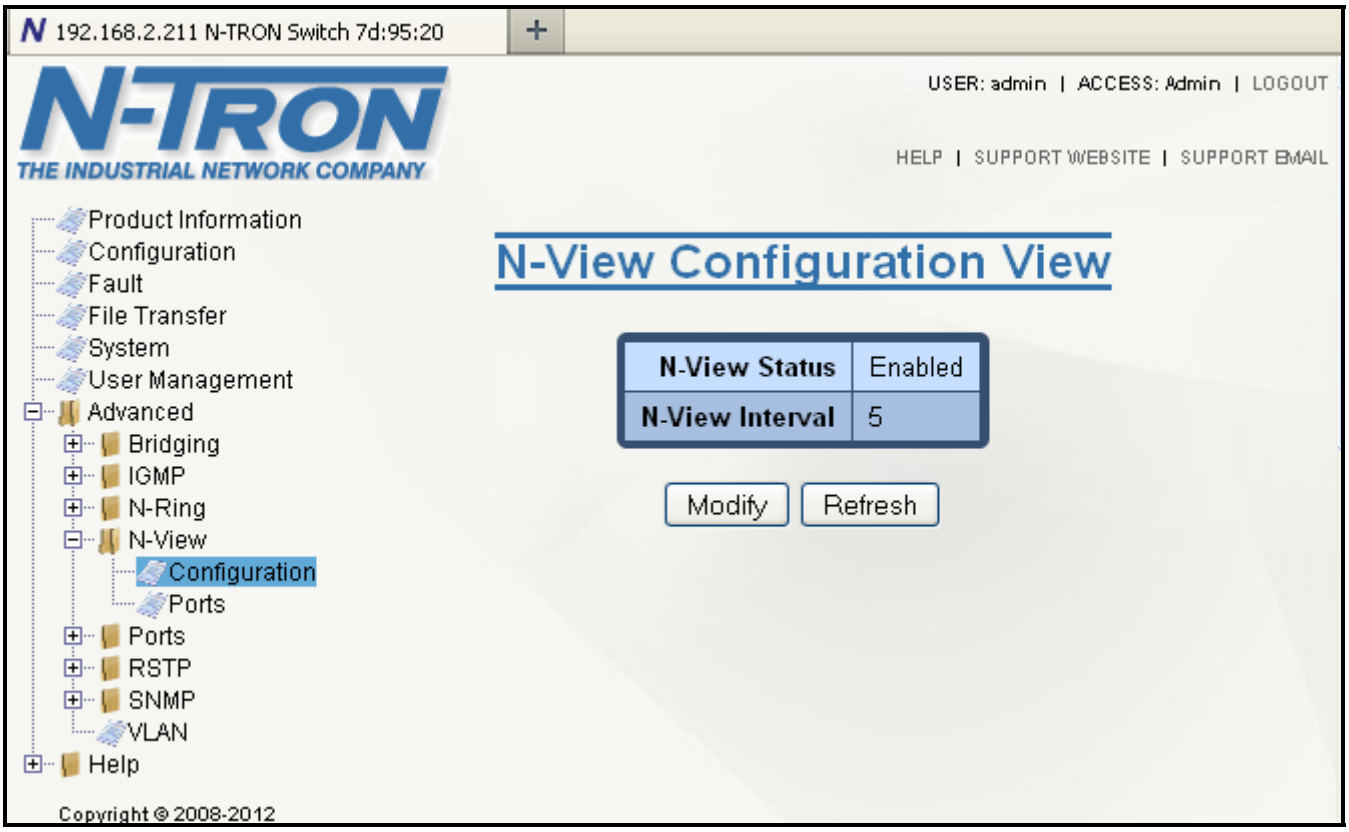
Note ” Fault: N-Ring Fault.” in red near the top of the display.

Note that the break is identified in red by switches and ports. In this case, N-Ring manager A2 to N-Ring active member Switch Number 1 TX2 is broken.

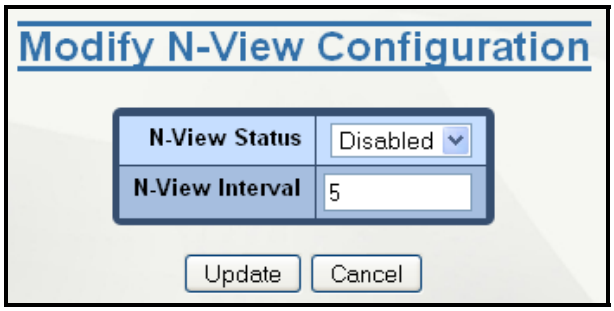
Note “Switch order may be incorrect and all switches may not be shown.” in yellow. This is because since the Sign On frames cannot get around the N-Ring the data may not be updated since the last time they did.

N-View – Configuration

The Configuration tab under the N-View category will display two basic variables for N-View, the status (Enabled or Disabled) and the interval between packets.

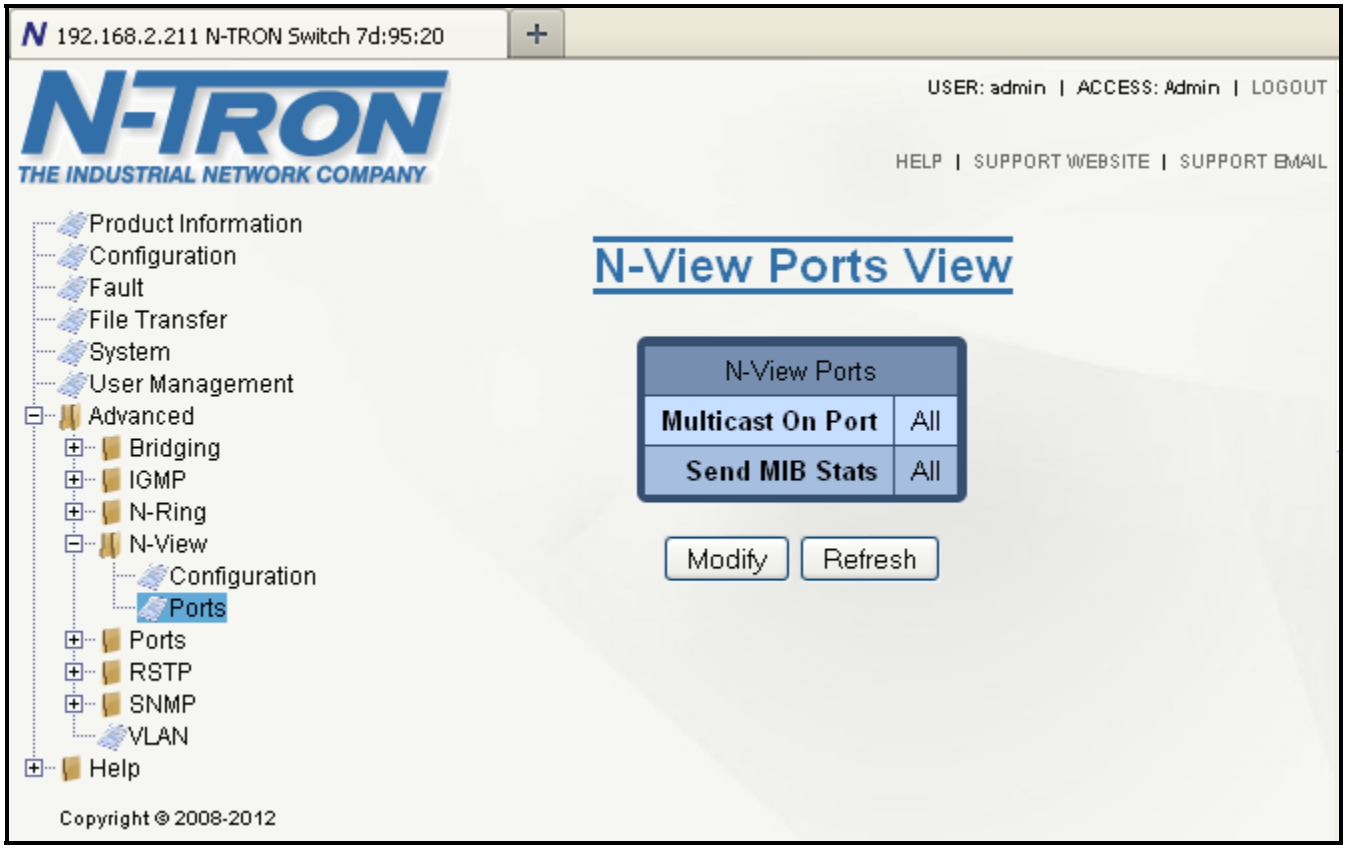


Following the Modify button on the above example, the administrator can modify the variable to change the frequency with which N-View reports information. Increasing the interval will slow the update rate. Decreasing the interval will allow N-View to report more frequently. The range is 5 to 500 seconds. Additionally, you may Disable or Enable N-View altogether.



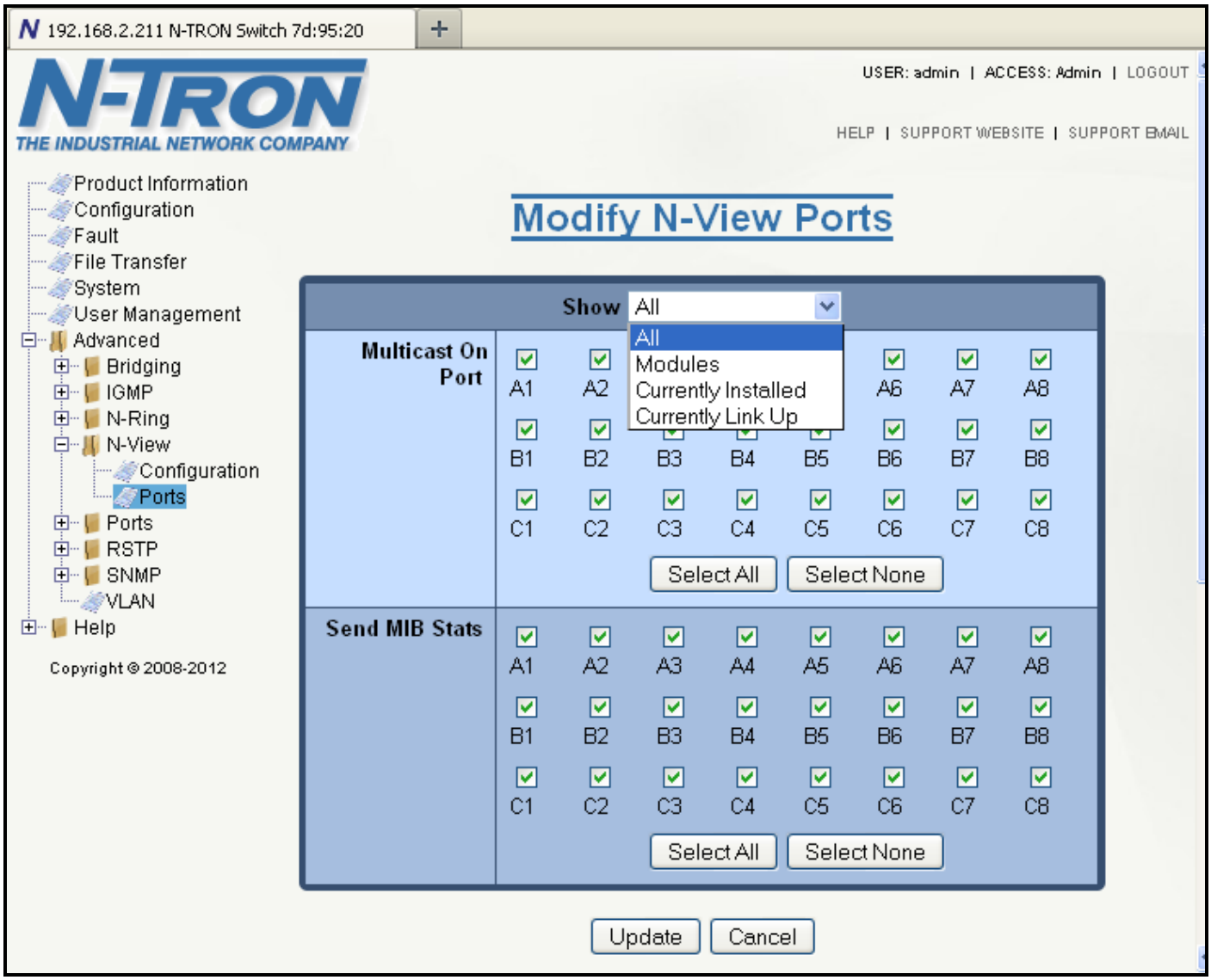
N-View – Ports

The Ports tab under the N-View category will display a list of all the configured ports on the NT24k unit along with the ports transmitting N-View related multicast packets and MIB stats respectively.



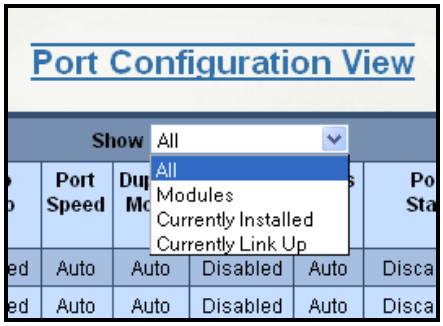
N-View – Ports, Continued…

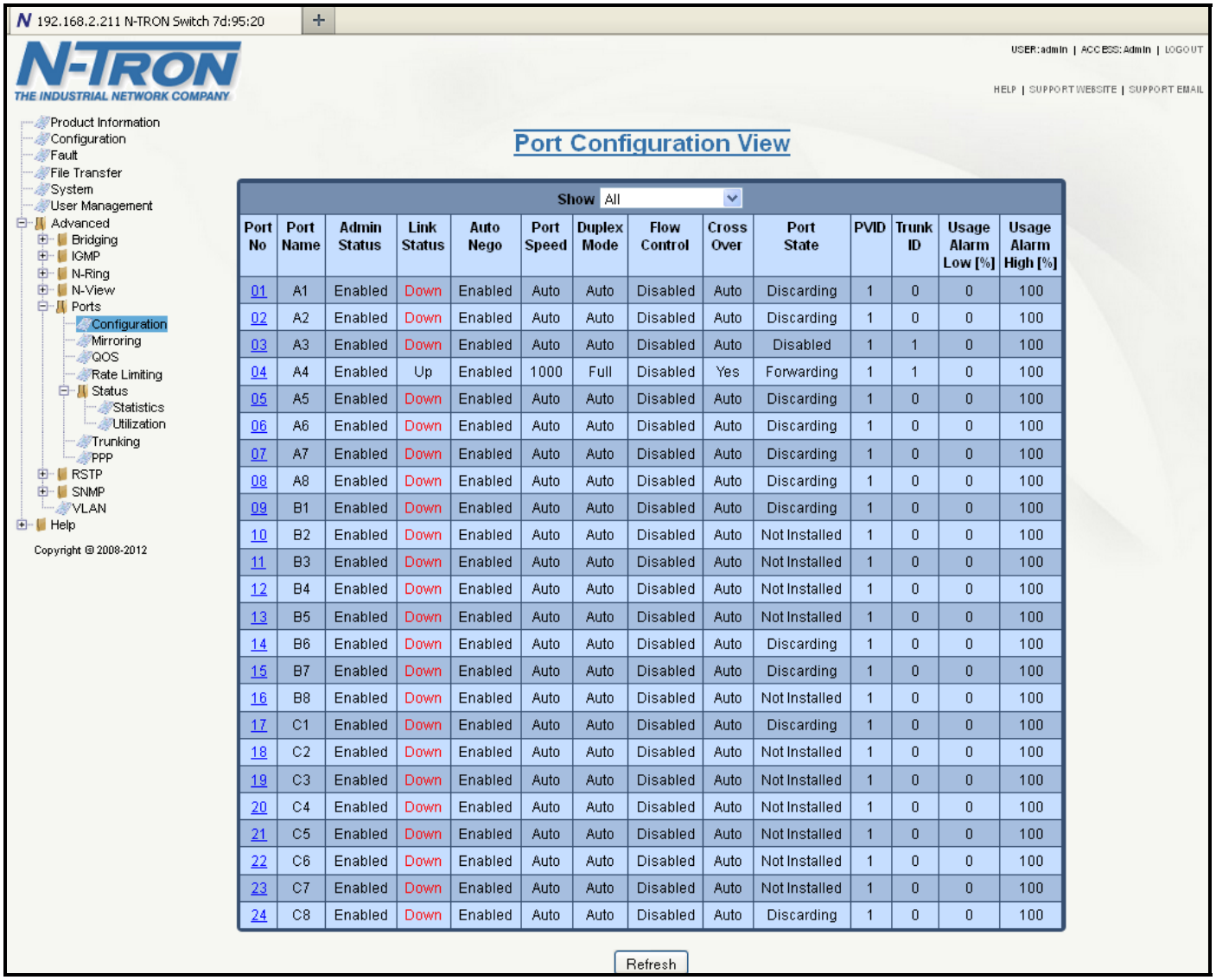
Following the Modify button on the above example, the administrator can modify these two variables to enable or disable N-View related multicast out of the port and if MIB stats are sent out for those ports. The administrator can view ports that are possible to install (Modules), currently installed, or currently linked up.



Ports – Configuration

The Configuration tab under the Ports category will show a detailed overview of all the ports on the switch. The administrator can view ports that are possible to install (Modules), currently installed, or currently linked up. The following information is displayed.:



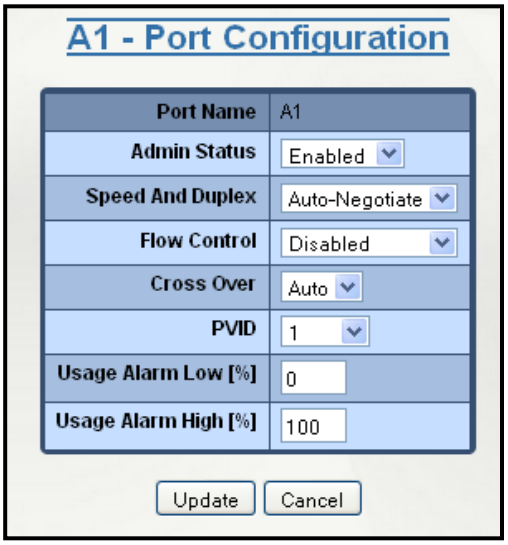


Port No	Port Name	Admin Status	Link Status	Auto Nego	Port Speed	Duplex Mode	Flow Control	Cross Over	Port State	PVID	Trunk ID	Usage Alarm Low [%]	Usage Alarm High [%]
01	A1	Enabled	Down	Enabled	Auto	Auto	Disabled	Auto	Discarding	1	0	0	100
02	A2	Enabled	Down	Enabled	Auto	Auto	Disabled	Auto	Discarding	1	0	0	100
03	A3	Enabled	Down	Enabled	Auto	Auto	Disabled	Auto	Disabled	1	1	0	100
04	A4	Enabled	Up	Enabled	1000	Full	Disabled	Yes	Forwarding	1	1	0	100
05	A5	Enabled	Down	Enabled	Auto	Auto	Disabled	Auto	Discarding	1	0	0	100
06	A6	Enabled	Down	Enabled	Auto	Auto	Disabled	Auto	Discarding	1	0	0	100
07	A7	Enabled	Down	Enabled	Auto	Auto	Disabled	Auto	Discarding	1	0	0	100
08	A8	Enabled	Down	Enabled	Auto	Auto	Disabled	Auto	Discarding	1	0	0	100
09	B1	Enabled	Down	Enabled	Auto	Auto	Disabled	Auto	Discarding	1	0	0	100
10	B2	Enabled	Down	Enabled	Auto	Auto	Disabled	Auto	Not Installed	1	0	0	100
11	B3	Enabled	Down	Enabled	Auto	Auto	Disabled	Auto	Not Installed	1	0	0	100
12	B4	Enabled	Down	Enabled	Auto	Auto	Disabled	Auto	Not Installed	1	0	0	100
13	B5	Enabled	Down	Enabled	Auto	Auto	Disabled	Auto	Not Installed	1	0	0	100
14	B6	Enabled	Down	Enabled	Auto	Auto	Disabled	Auto	Discarding	1	0	0	100
15	B7	Enabled	Down	Enabled	Auto	Auto	Disabled	Auto	Discarding	1	0	0	100
16	B8	Enabled	Down	Enabled	Auto	Auto	Disabled	Auto	Not Installed	1	0	0	100
17	C1	Enabled	Down	Enabled	Auto	Auto	Disabled	Auto	Discarding	1	0	0	100
18	C2	Enabled	Down	Enabled	Auto	Auto	Disabled	Auto	Not Installed	1	0	0	100
19	C3	Enabled	Down	Enabled	Auto	Auto	Disabled	Auto	Not Installed	1	0	0	100
20	C4	Enabled	Down	Enabled	Auto	Auto	Disabled	Auto	Not Installed	1	0	0	100
21	C5	Enabled	Down	Enabled	Auto	Auto	Disabled	Auto	Not Installed	1	0	0	100
22	C6	Enabled	Down	Enabled	Auto	Auto	Disabled	Auto	Not Installed	1	0	0	100
23	C7	Enabled	Down	Enabled	Auto	Auto	Disabled	Auto	Not Installed	1	0	0	100
24	C8	Enabled	Down	Enabled	Auto	Auto	Disabled	Auto	Discarding	1	0	0	100

Port Number
This is the port index.
Port Name
This field displays the name of the port, such as A1 for the first port in Module A.
Admin Status
This configurable field displays the existing status of the port whether it is **Enabled/Disabled.**
Link Status
Current Link state of the port.
Auto Negotiation State
This configurable field displays the current auto-negotiation state whether it is **Enabled/Disable.**
Port Speed
This configurable field displays the speed of each port **10/100/1000** Mbps.
Duplex Mode
This configurable field displays the existing mode of the port whether it is **Full Duplex/Half Duplex.**
Flow Control State
This configurable field displays the existing flow control status of each port. When enabled, the individual port supports half-duplex back pressure and full-duplex flow control. The default is **Disabled.**
Crossover Mode
This configurable field displays the existing crossover mode of the port. This can be Yes, No, or Auto. Auto is the default.
Port State
The current RSTP status of a port. It may contain **Disable/Discarding/Learning/Forwarding.**
PVID
This configurable field displays the existing port VLAN ID setting. The allowable range is **1-4094.**
Trunk ID
When the port is an active member of a trunk group, the trunk's ID value is shown. A zero value indicates that the port is not an active trunk member.
Usage Alarm Low (%)
The bandwidth utilization percentage below which a fault will be triggered if enabled. For half duplex the bandwidth utilization percentage is the sum of both RX and TX bandwidth utilization, and for full duplex this is the higher of TX or RX bandwidth utilization. See Port Utilization View and Port Usage Fault on Fault Configuration View.
Usage Alarm High (%)
The bandwidth utilization percentage above which a fault will be triggered if enabled. For half duplex the bandwidth utilization percentage is the sum of both RX and TX bandwidth utilization, and for full duplex this is the higher of TX or RX bandwidth utilization. See Port Utilization View and Port Usage Fault on Fault Configuration View.

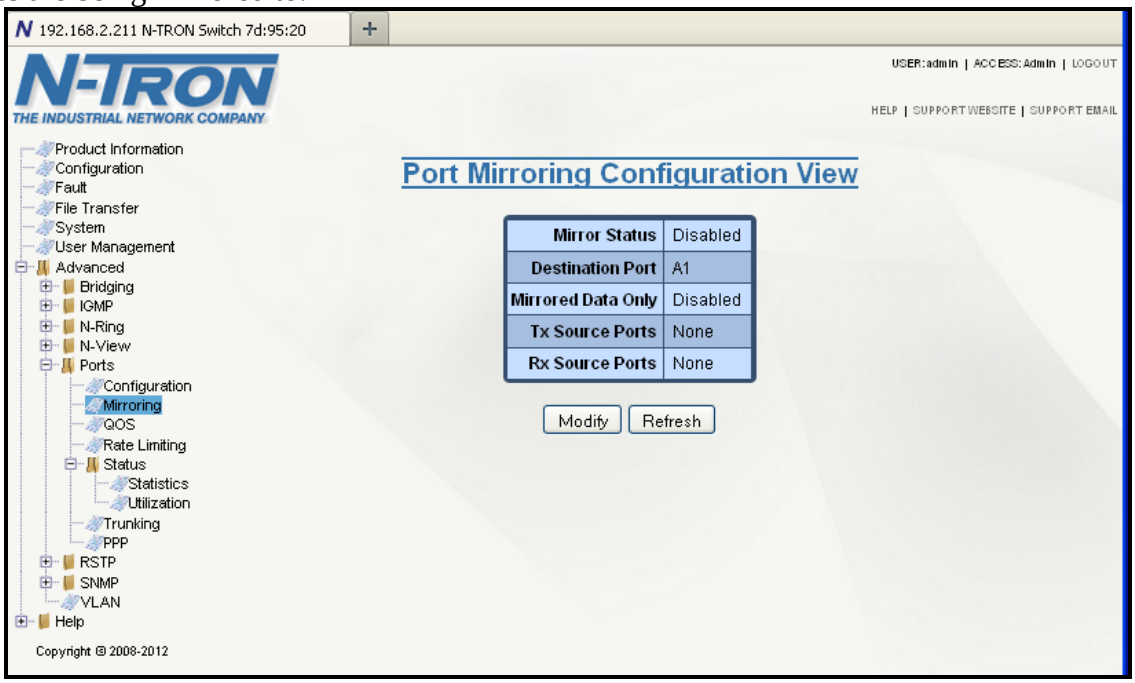
The User can click on the Port Number to configure each port individually. This will allow the user to change the port's settings for the following fields:

Admin Status
Speed and Duplex
Flow Control
Cross Over
PVID
Usage Alarm Low
Usage Alarm High

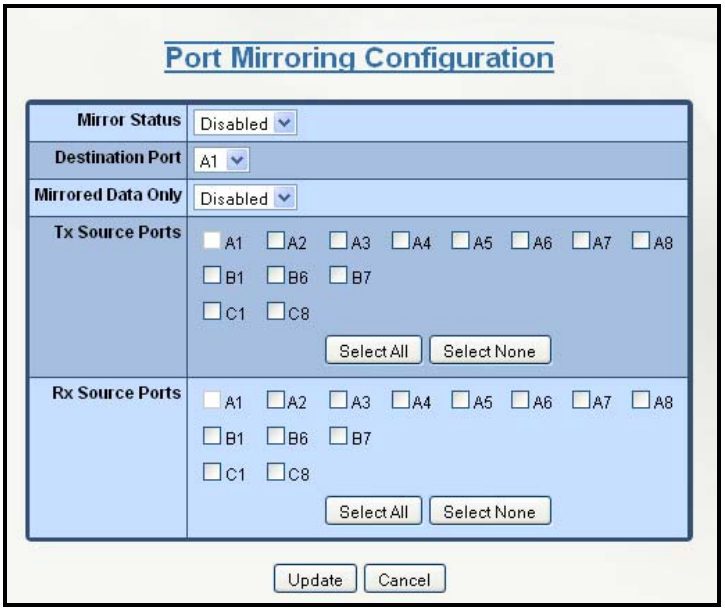


Ports – Mirroring

A mirroring port is a dedicated port that is configured to receive the copies of Ethernet frames that are being transmitted out and also being received in from any other port that is being monitored. The Mirroring tab under the Ports category displays the status including the list of Source Ports and the Destination Port that the Sources are being mirrored to.

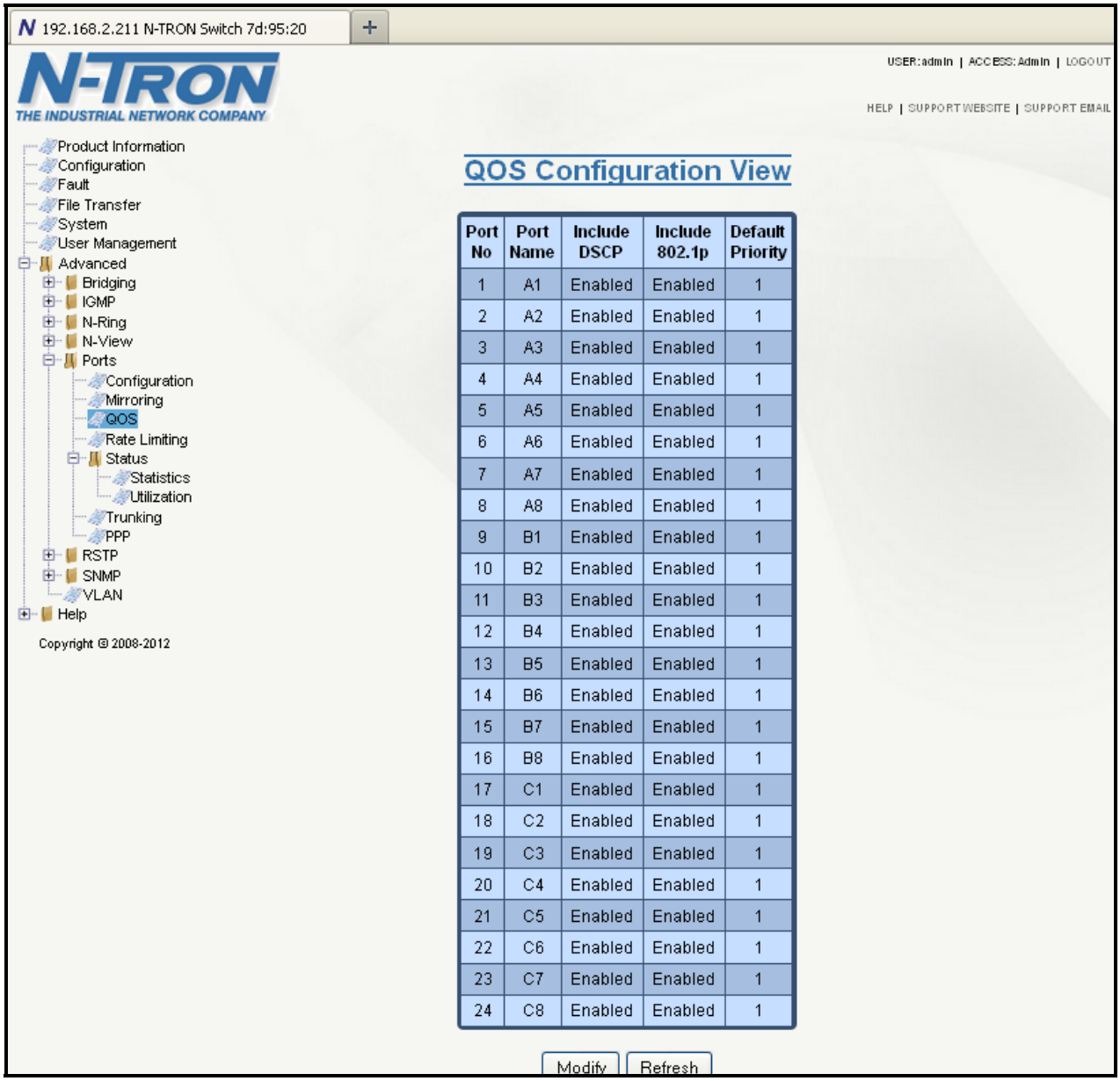


Using the Modify button, you can enable the status of port mirroring and select source ports and the destination port that the source ports will be mirrored to. The check boxes can be used to select the ports that will be mirrored to the destination port. 'Mirrored Data Only' can be selected for mirrored data only to be transmitted to the destination port, as opposed to mirrored data and whatever other data is otherwise destined for the destination Port.



Ports – QOS

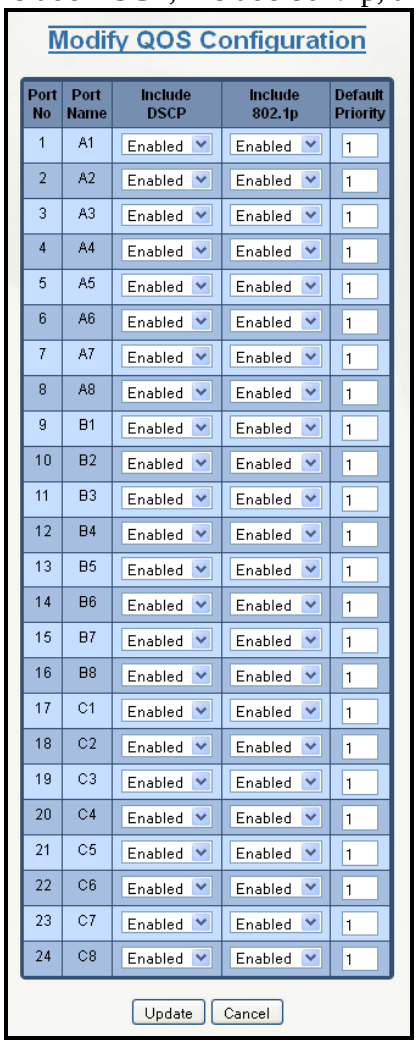
The QOS decision tree chooses a frame's output port priority and the egress frame's IEEE802.1p User Priority value (if needed) based on the QOS settings and the User Priority value (if any) in the ingress frame. Both the internal port priority setting and egress frame User Priority value are always assigned the same value (0-7, 7=highest priority). If the ingress frame is an IP packet, the RFC 2474 DSCP field in the packet will be passed unchanged to the egress frame.



Port No	Port Name	Include DSCP	Include 802.1p	Default Priority
1	A1	Enabled	Enabled	1
2	A2	Enabled	Enabled	1
3	A3	Enabled	Enabled	1
4	A4	Enabled	Enabled	1
5	A5	Enabled	Enabled	1
6	A6	Enabled	Enabled	1
7	A7	Enabled	Enabled	1
8	A8	Enabled	Enabled	1
9	B1	Enabled	Enabled	1
10	B2	Enabled	Enabled	1
11	B3	Enabled	Enabled	1
12	B4	Enabled	Enabled	1
13	B5	Enabled	Enabled	1
14	B6	Enabled	Enabled	1
15	B7	Enabled	Enabled	1
16	B8	Enabled	Enabled	1
17	C1	Enabled	Enabled	1
18	C2	Enabled	Enabled	1
19	C3	Enabled	Enabled	1
20	C4	Enabled	Enabled	1
21	C5	Enabled	Enabled	1
22	C6	Enabled	Enabled	1
23	C7	Enabled	Enabled	1
24	C8	Enabled	Enabled	1

Ports – QOS, Continued …

The QOS configuration settings are: Include DSCP, Include 802.1p, and Default Priority:



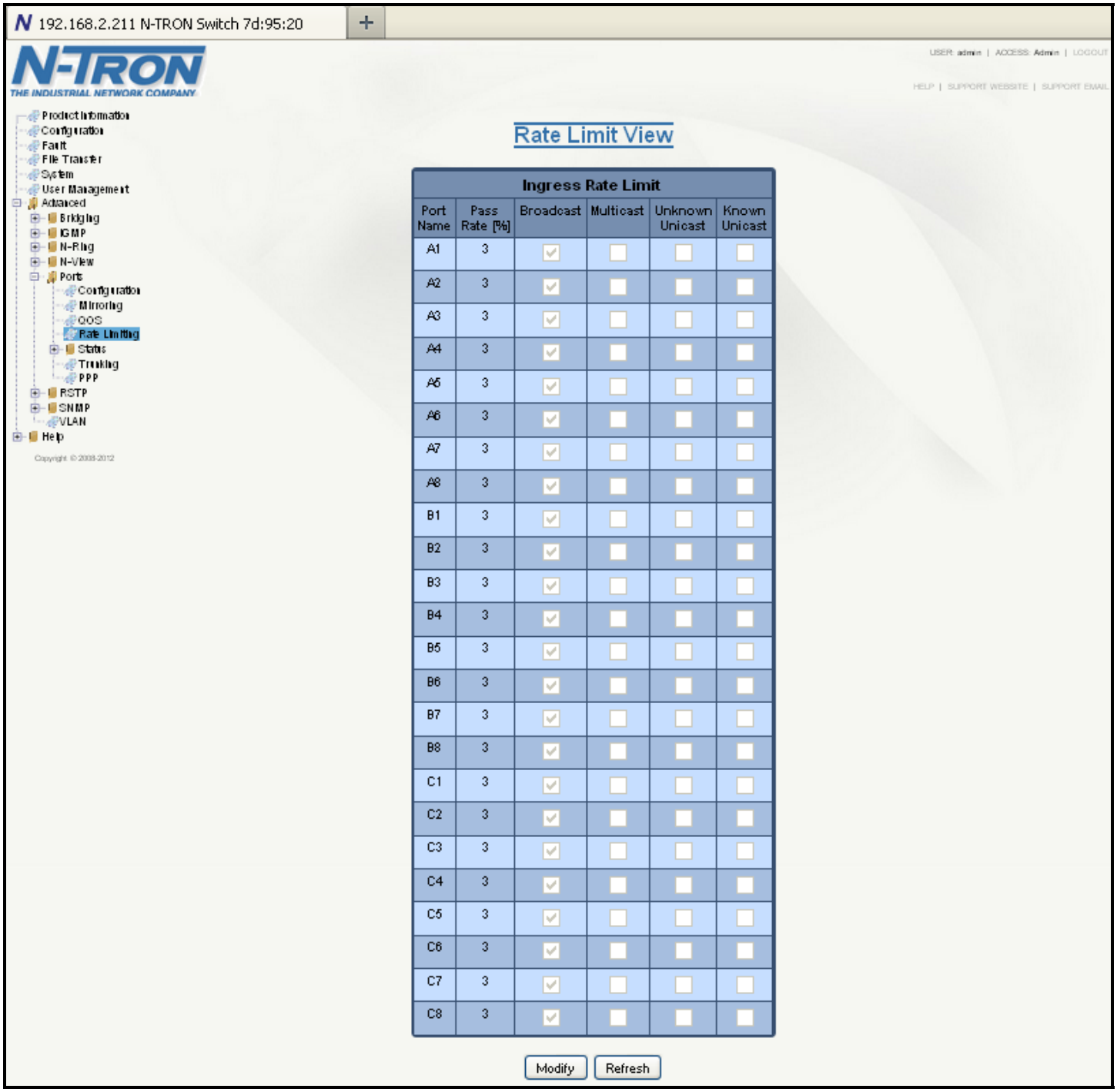
Include DSCP: This configurable field displays the status of whether or not to include the ingress frame's RFC 2474 DSCP value in determining the transmit priority and egress frame's IEEE802.1p User Priority value. If the ingress frame type is IP (IPv4 or IPv6) and Include DSCP is enabled, DSCP processing will override all other settings. (see QOS SELECTION CHART below). The default value is enabled.

Include 802.1p: This configurable field displays the status of whether or not to include the ingress frame's IEEE802.1p User Priority value in determining the transmit priority and egress frame's IEEE802.1p User Priority value. This setting is used only if the frame type is not IP (IPv4 or IPv6) or the Include DSCP setting is disabled. (see QOS SELECTION CHART below). The default value is enabled.

Default Priority: This configurable field displays the default QOS priority for the transmit priority value and the egress frame's IEEE802.1p User Priority value if not otherwise assigned by DSCP or IEEE802.1p processing. The range is 0-7, highest priority=7. The default value is 1.

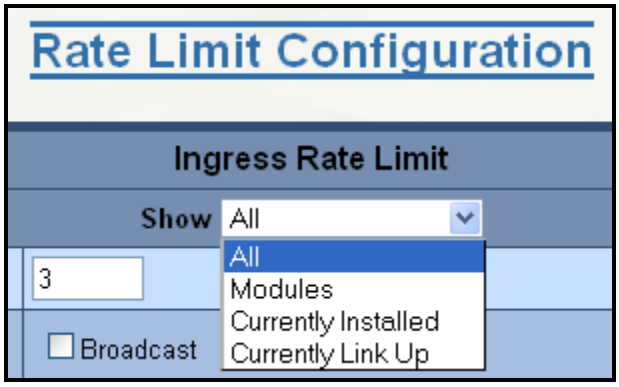
Ports – Rate Limiting

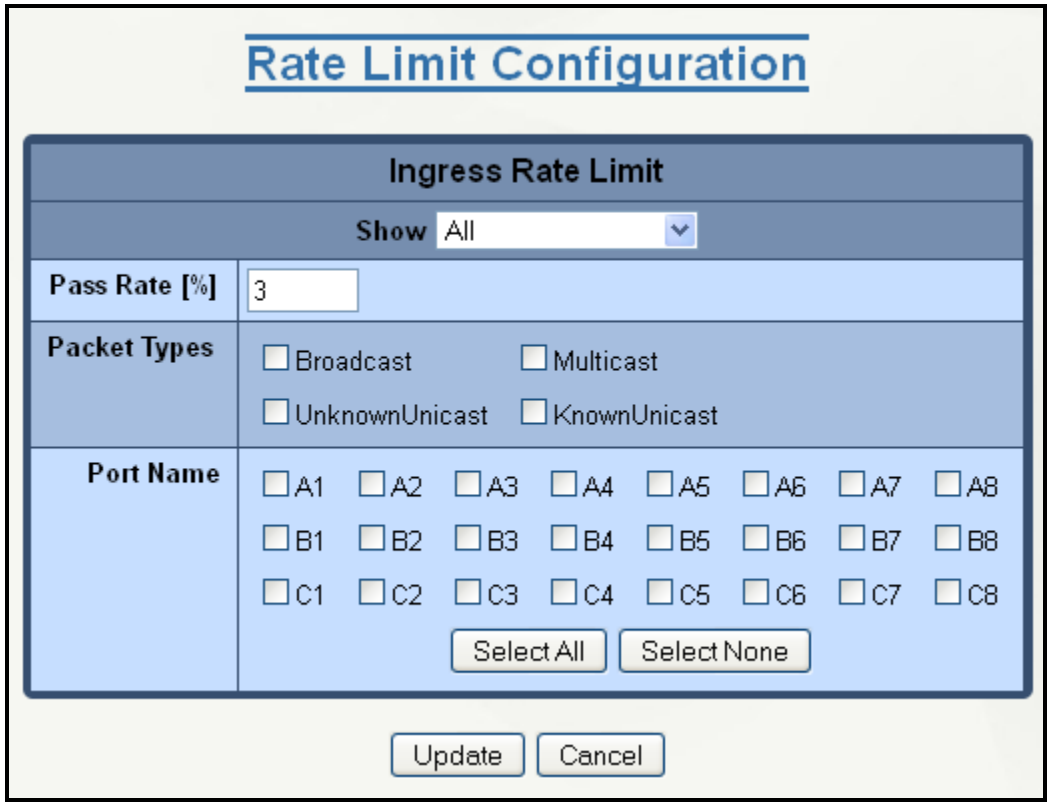
The Rate Limiting/link will display all the ports tht are installed in the NT24k unit and will list the Pass Rate Percentage for each port for each of: Broadcast, Multicast, Unknown Unicast, and Known Unicast. A packet type will be affected when the checkbox is selected if it exceeds the total number of packets subject to the ingress rate limit percentage within an assigned time period. The time periods are: 1 Gbps = 10 ms, 100 Mbps = 100 ms, 10 Mbps = 1 sec. That is, bursts above the limit are passed. Broadcast Pass Rate Percentage defaults to selected and 3%. A Modify button is provided to change these fields.



Ports – Rate Limiting, Continued …

Following the Modify button on the above example, the administrator can modify the Pass Rate Percentage for each and every port. The administrator can view ports that are possible to install (Modules), currently installed, or currently linked up. The following information is displayed.:

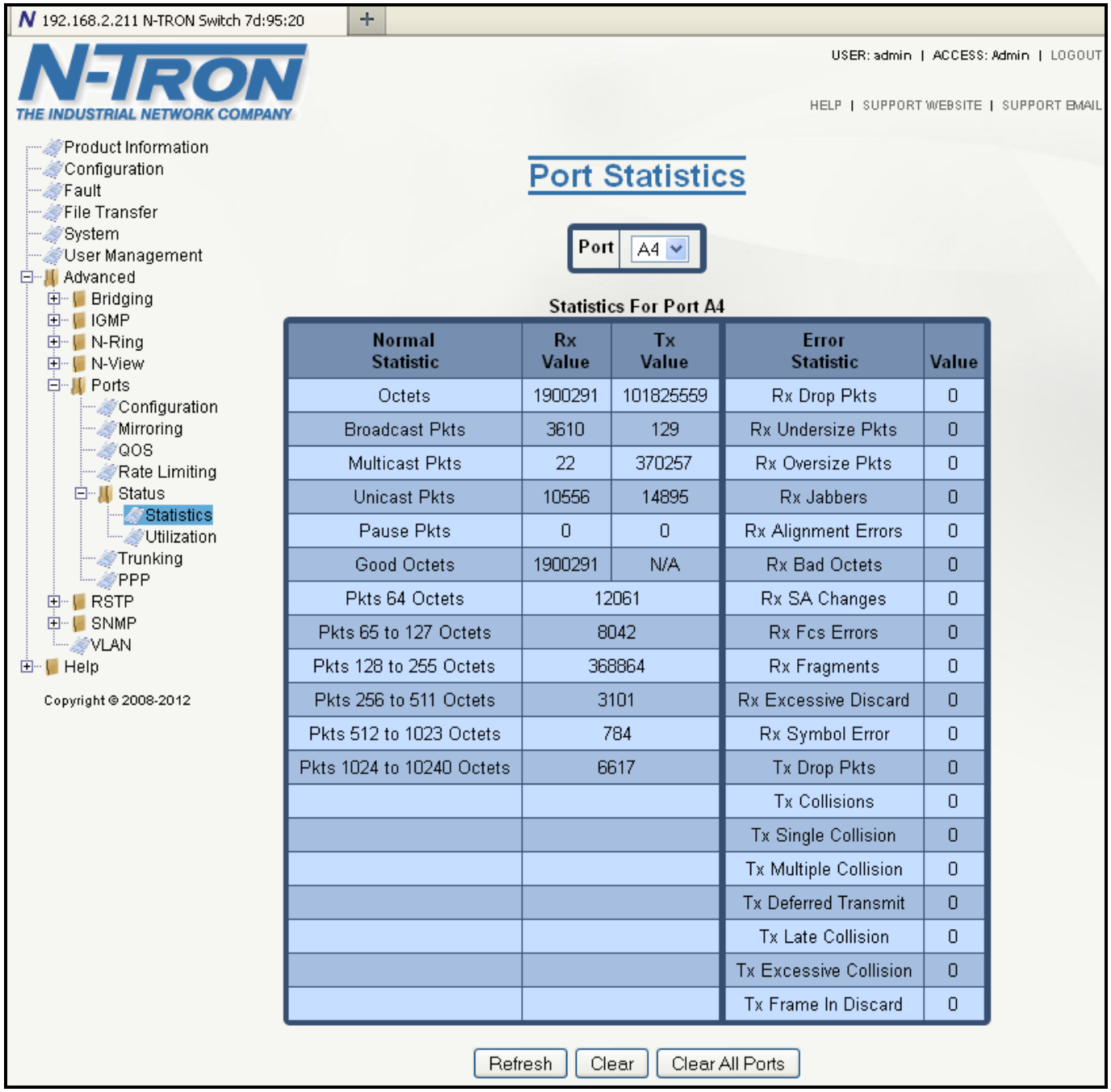




Note: Unicast packets with destinations not in the ARL table can be rate limited rather than all being Flooded. That is ‘Unknown Unicast’.

Ports – Status - Statistics

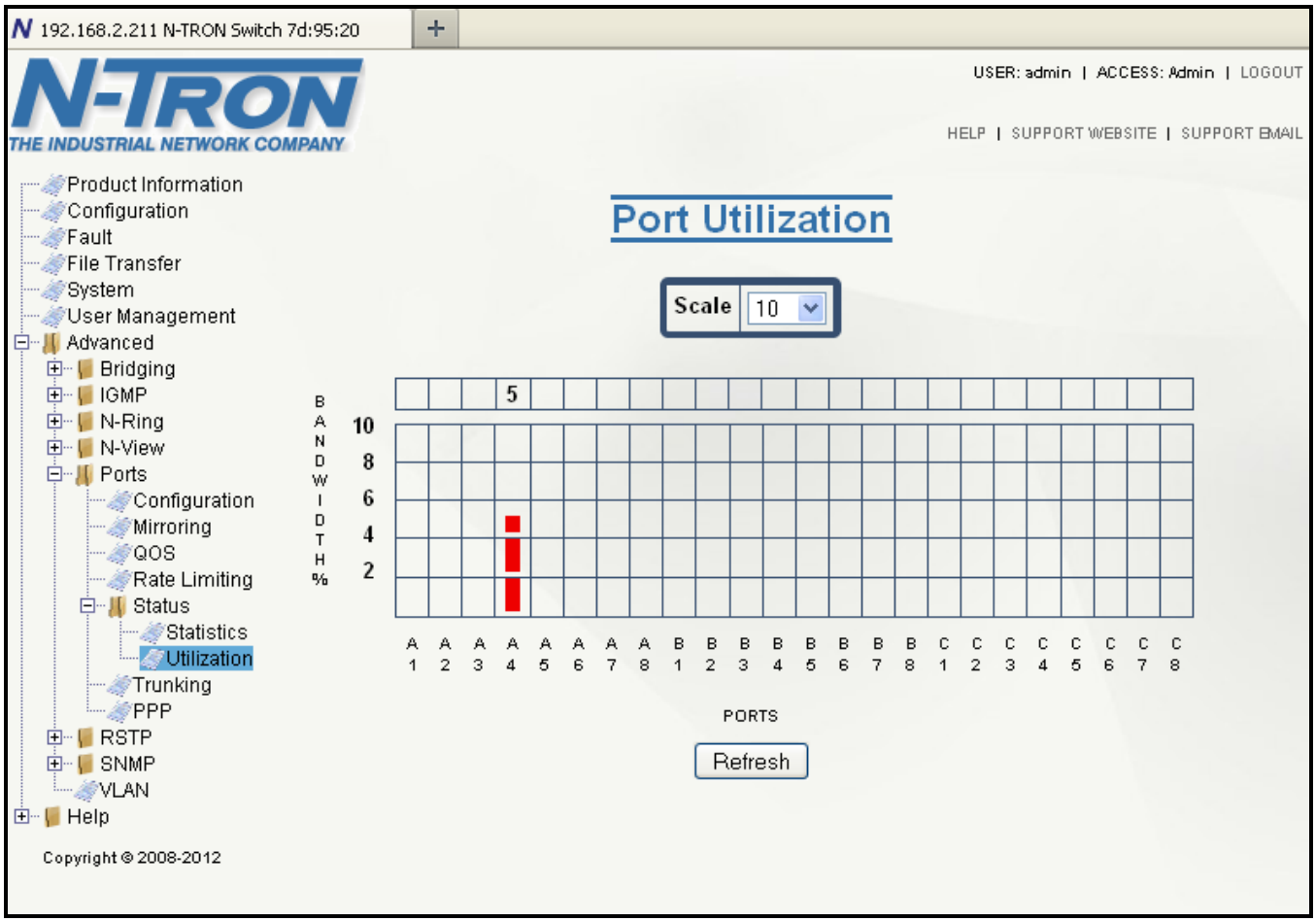
Displays the MIB counters for the selected port, specified by the Port pull-down menu. The Clear button will reset all counters for the selected port. The Clear All Ports button will reset all counters for all ports, including the selected port.



Normal Statistic	Rx Value	Tx Value	Error Statistic	Value
Octets	1900291	101825559	Rx Drop Pkts	0
Broadcast Pkts	3610	129	Rx Undersize Pkts	0
Multicast Pkts	22	370257	Rx Oversize Pkts	0
Unicast Pkts	10556	14895	Rx Jabbers	0
Pause Pkts	0	0	Rx Alignment Errors	0
Good Octets	1900291	N/A	Rx Bad Octets	0
Pkts 64 Octets	12061		Rx SA Changes	0
Pkts 65 to 127 Octets	8042		Rx Fcs Errors	0
Pkts 128 to 255 Octets	368864		Rx Fragments	0
Pkts 256 to 511 Octets	3101		Rx Excessive Discard	0
Pkts 512 to 1023 Octets	784		Rx Symbol Error	0
Pkts 1024 to 10240 Octets	6617		Tx Drop Pkts	0
			Tx Collisions	0
			Tx Single Collision	0
			Tx Multiple Collision	0
			Tx Deferred Transmit	0
			Tx Late Collision	0
			Tx Excessive Collision	0
			Tx Frame In Discard	0

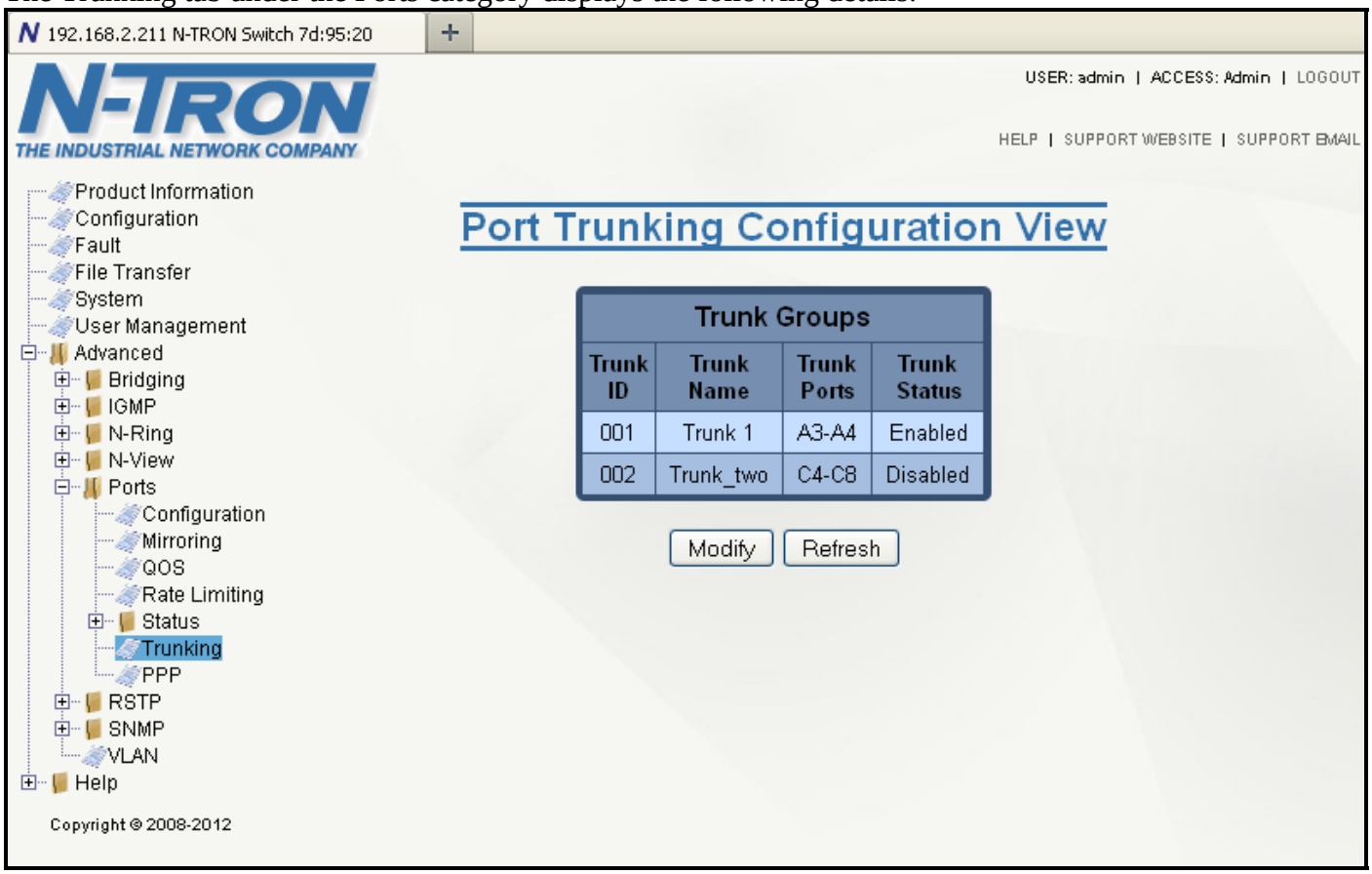
Ports – Status - Utilization

Shows a bandwidth percentage graph of all the ports. The graph is scaled based on the Scale pull-down menu selection.



Ports – Trunking

The Trunking tab under the Ports category displays the following details:



Trunk ID: The trunk identifier number. The valid range is 1-127.

Trunk Name: The descriptive name of the trunk. The name can consist of alphanumeric characters and the special characters '#', '_', '-', and '.'.

Trunk Ports: The ports associated with the trunk.

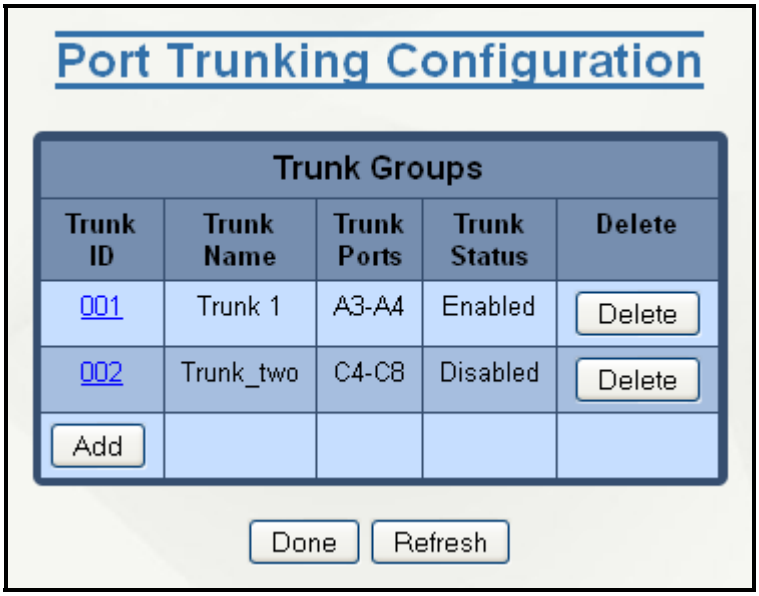
Trunk Status: The existing status of the trunk. It can be either enabled or disabled.

Notes:

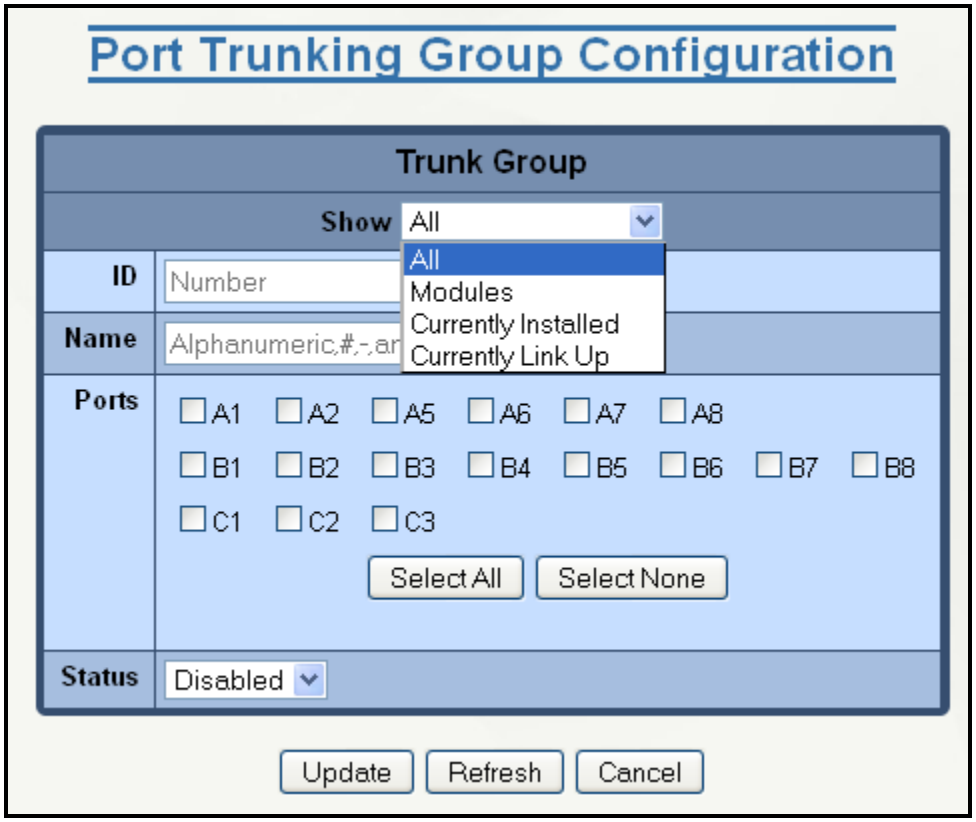
1. All ports in the same Trunk must have the same Port Configuration settings, including PVID.
2. All ports in the same Trunk must belong to the same VLAN and have the same tagging options.
3. If a port is both a RSTP port and an enabled trunk group member, then the port will be disabled for RSTP. The RSTP port status can be seen under advanced RSTP ports.

Ports – Trunking, Continued

By selecting the Modify button, you can then add, delete or modify a trunk group:

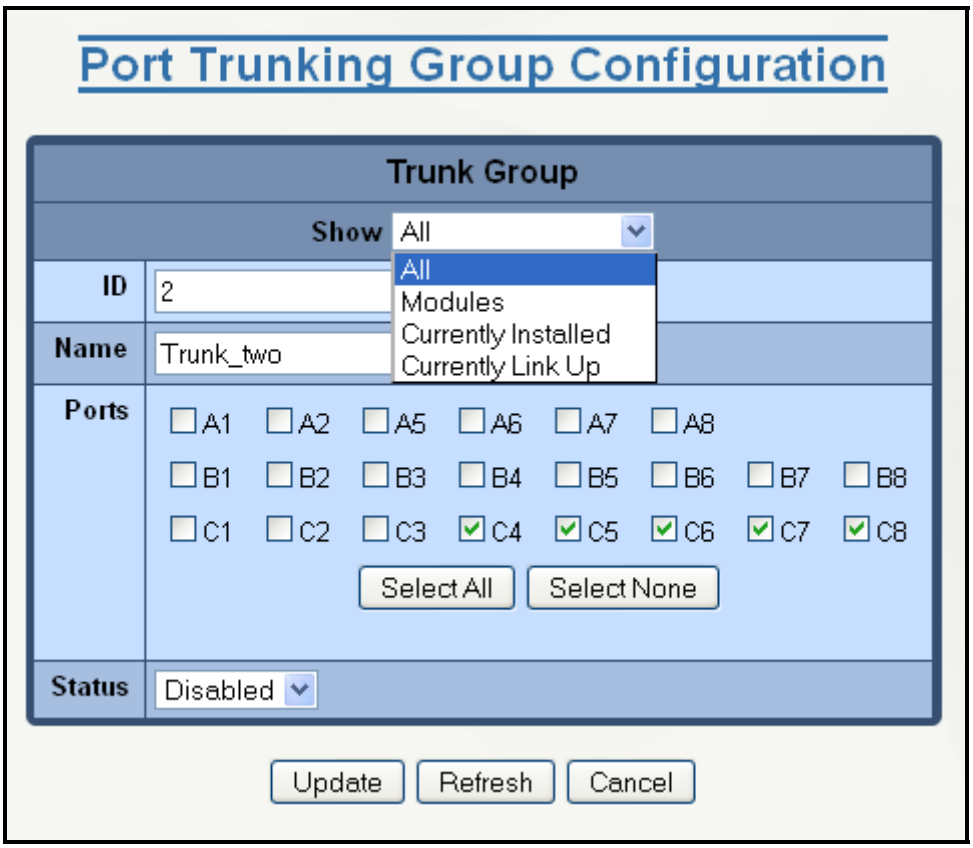


By selecting 'Add' you can first decide to view ports that are possible to install (Modules), currently installed, or currently linked up. Then you can specify a trunk group to add.



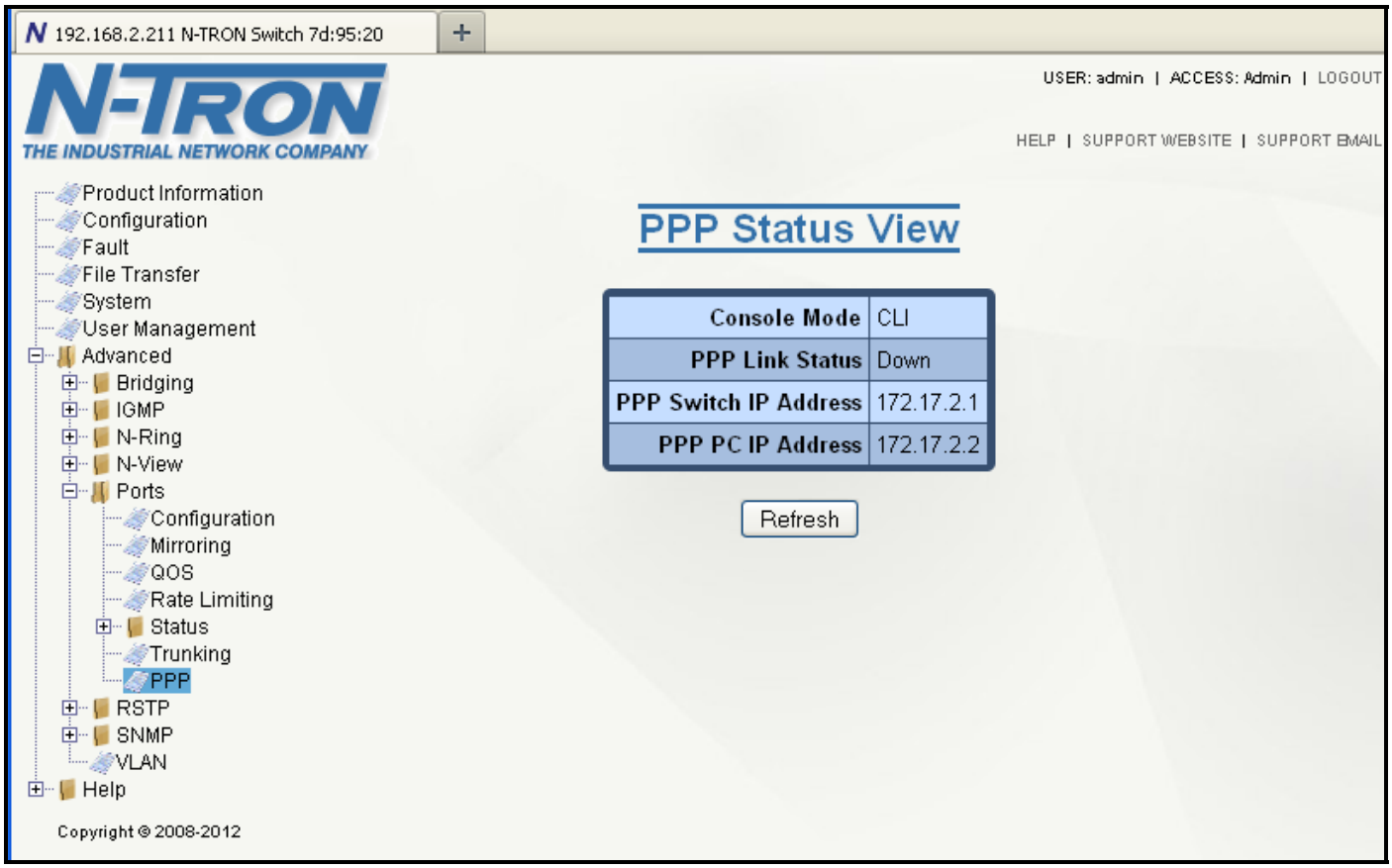
Ports – Trunking, Continued

By selecting a trunk ID hyperlink from the Port Trunking Configuration View, you can first decide to view ports that are possible to install (Modules), currently installed, or currently linked up. Then you can specify changes to a trunk group..



Ports – PPP

The console can be either in CLI mode, or PPP mode. The PPP mode provides a TCP/IP connection over the serial port, allowing for viewing switch information and making configuration changes by using a web browser. PPP mode is entered by using the PPP command on the console. To change from PPP to CLI mode, you must reboot the switch.



Console Mode CLI - The console is in the command mode (the default mode).
PPP - The console is in the PPP mode.

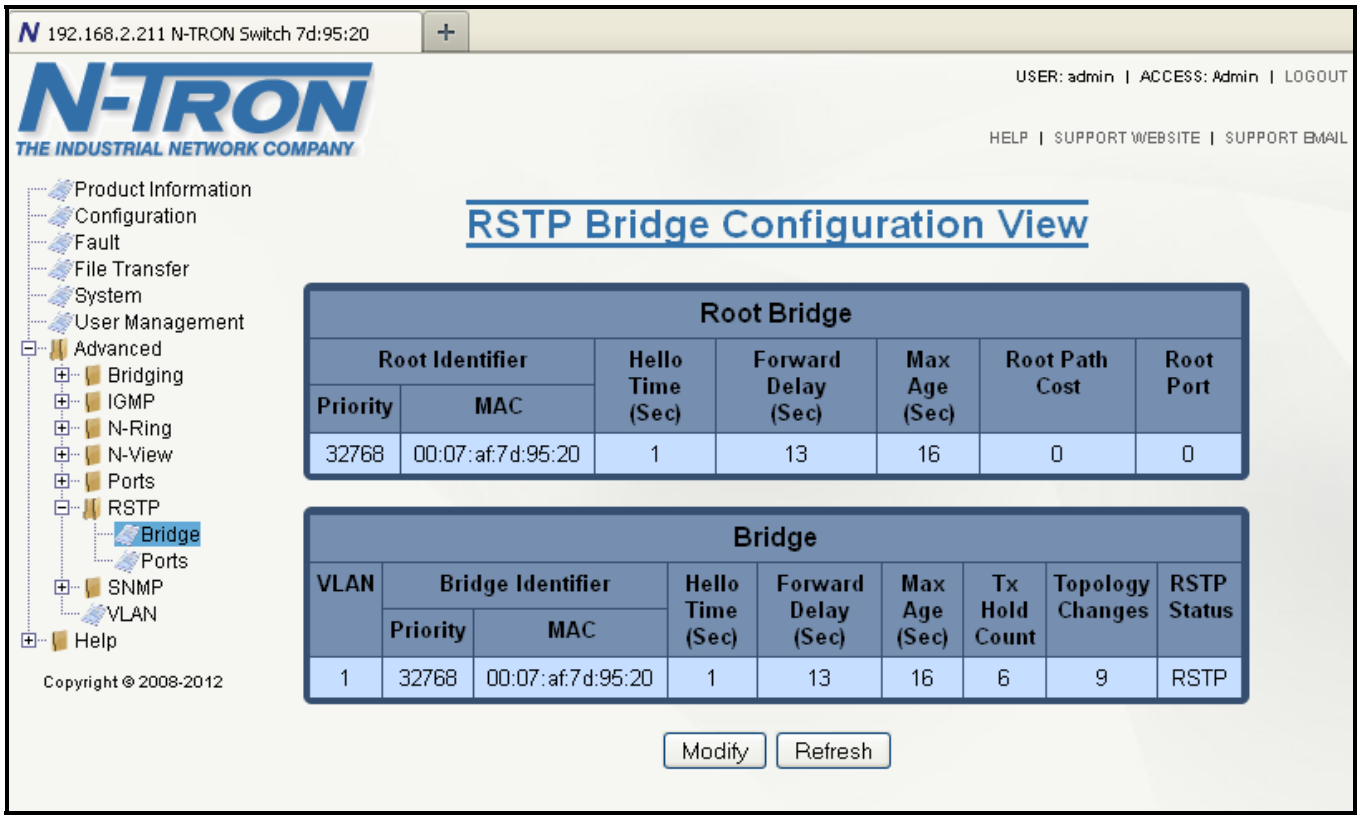
PPP Link Status current PPP link state

PPP Switch IP Address The IP address for the switch side of the PPP link.

PPP PC IP Address The IP address for the PC side of the PPP link.

RSTP – Bridge

The Bridge tab under the RSTP category will display the RSTP information for the RSTP Root Bridge and for the RSTP Bridge on this switch.



Notes:

1. RSTP & N-Ring are different modes and cannot share links or segments. If a port is both an RSTP port and an active N-Ring port, then the port will be disabled for RSTP.
2. Do not create redundant links unless either RSTP or N-Ring is enabled.
3. If a port is both a RSTP port and an enabled trunk group member, then the port will be disabled for RSTP. The RSTP port status can be seen under advanced RSTP ports.
4. It is recommended that RSTP rings consist of RSTP capable switches.
5. RSTP is supported on only one VLAN.

RSTP – Bridge, Continued …

Root Bridge - This is the identity and parameters of the RSTP Root Bridge.

Root Identifier Priority:	The Priority of the Root Bridge.
Root Identifier MAC:	The unique MAC of the Root Bridge. Possibly a different network device.
Hello Time (Sec):	The time interval, in seconds, between the transmission of Configuration BPDUs by Designated Ports.
Forward Delay (Sec):	The time spent, in seconds, by legacy STP Bridges in transitioning Root and Designated Ports to Forwarding. This delays Port transitions until other bridges have received spanning tree information.
Max Age (Sec):	For RSTP, this is the maximum hops allowed for any protocol message before it is discarded and no longer retransmitted. For STP, this is the maximum time, in seconds, that a bridge will wait for Configuration BPDUs before deciding it is no longer connected to the root bridge.
Root Path Cost:	The cost of the path to the Root Bridge via the Root Port of this bridge.
Root Port:	The Root Port of this Bridge. The Root Port provides the lowest cost path from this Bridge to the Root Bridge.

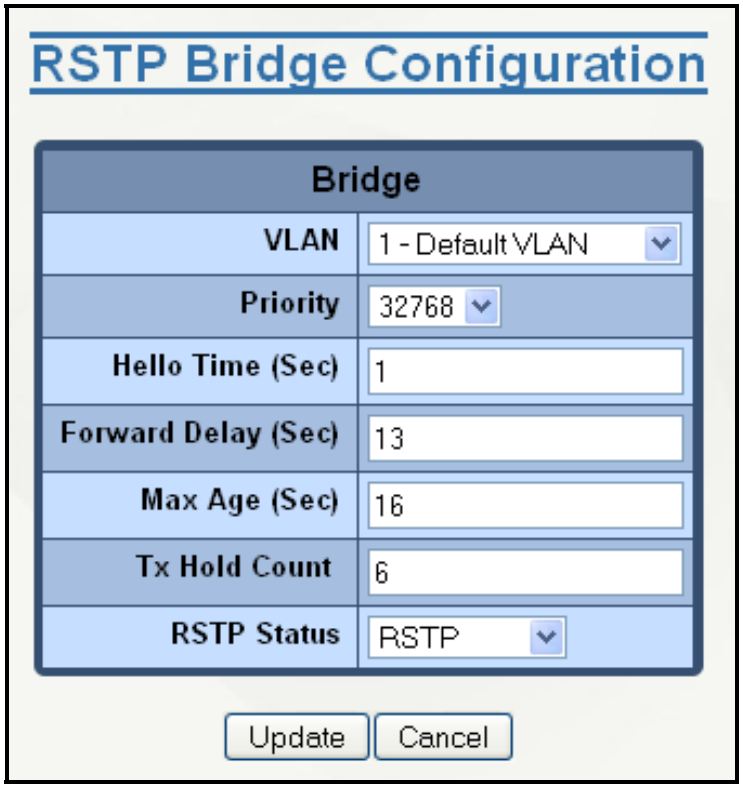
RSTP – Bridge, Continued …

Bridge - This is the configuration of the RSTP Bridge on this switch. When operating in a VLAN with legacy STP devices, use these values for the Bridge: Hello Time (Sec) = 2, Forward Delay (Sec) = 15, and Max Age (Sec) = 20.

VLAN	RSTP will operate on all ports of this VLAN. Protocol information will be transmitted VLAN-tagged or un-tagged depending on the Untag On Egress setting for this VLAN. This should be a valid VLAN ID. The default is VLAN 1.
Bridge Identifier Priority	The Priority of the this Bridge. The range is 0-61440. The default value is 32768.
Bridge Identifier MAC	The unique MAC of the this Bridge.
Hello Time (Sec)	The Hello Time, when this bridge is the Root Bridge or is attempting to become the Root Bridge. This is the time interval, in seconds, between the transmission of Configuration BPDUs by Designated Ports.The range is 1-10. Consult the user manual for other constraints. The default value is 1.
Forward Delay (Sec)	The Forward Delay, when this bridge is the Root Bridge or is attempting to become the Root Bridge. This is the time spent, in seconds, by legacy STP Bridges in transitioning Root and Designated Ports to Forwarding. This delays Port transitions until other bridges have received spanning tree information.The range is 4-30. Consult the user manual for other constraints. The default value is 13 seconds.
Max Age (Sec)	The Max Age when this bridge is the Root Bridge or is attempting to become the Root Bridge. For RSTP, this is the maximum hops allowed for any protocol message before it is discarded and no longer retransmitted. For STP, this is the maximum time, in seconds, that a bridge will wait for Configuration BPDUs before deciding it is no longer connected to the root bridge.The range is 6-40. Consult the user manual for other constraints. The default value is 16 seconds.
Tx Hold Count	This is the maximum number of Configuration BPDUs that can be transmitted in one second, from a port on this Bridge before transmission is throttled.The range is 1 to 10. The default is 6.
Topology Changes	This is the number of RSTP topology changes since the switch has been powered on or rebooted.
RSTP Status	This is the **current status** of the RSTP protocol on this bridge. This may be RSTP, Force STP, or Disabled

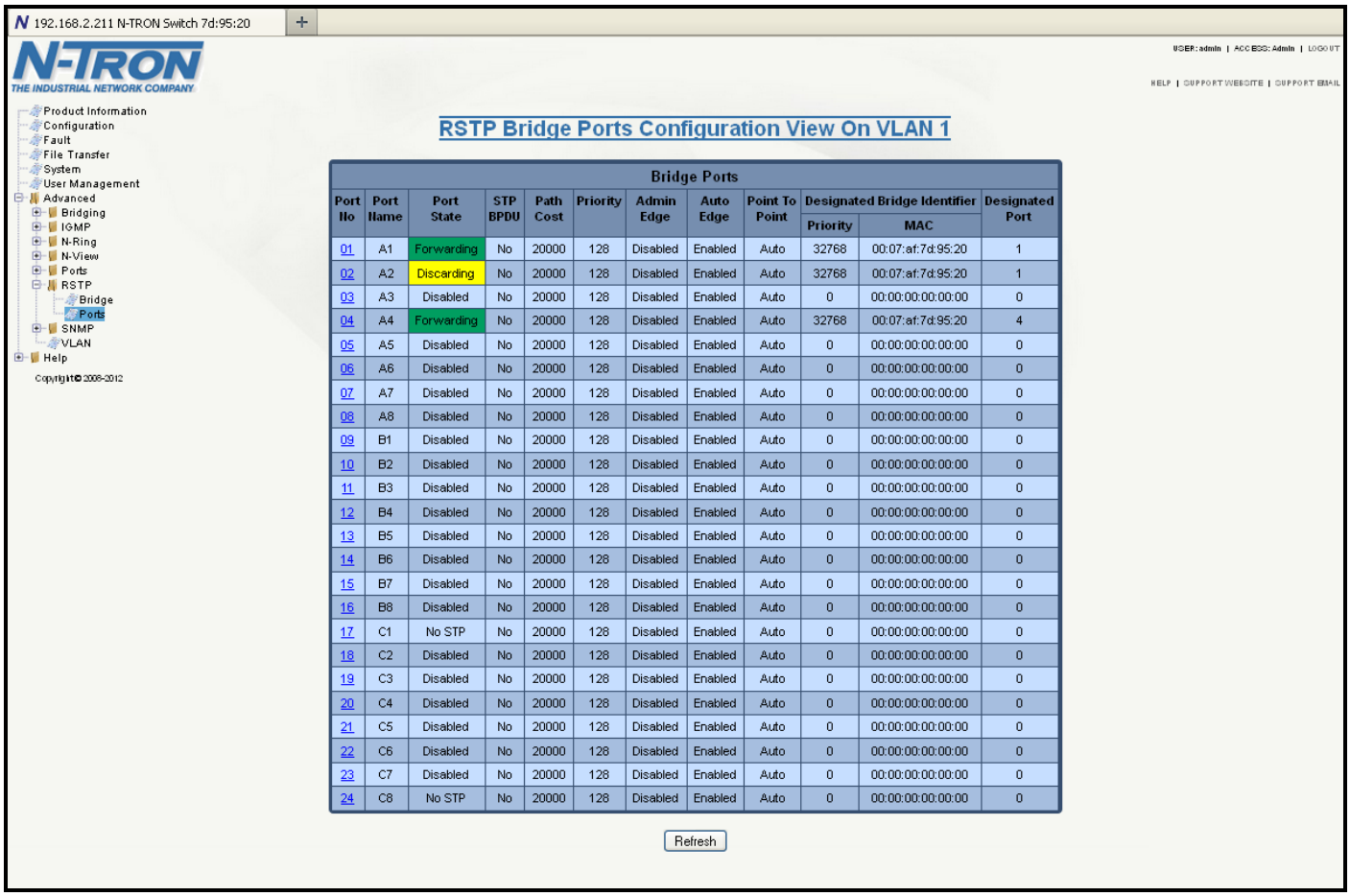
RSTP – Bridge, Continued …

The administrator can modify the Bridge parameters by pressing the ‘Modify’ button on the above page.



RSTP – Ports

Following the link for the view RSTP Ports, the administrator or user can see the current RSTP status of the ports on that VLAN. This will show information such as the Path Cost and the Port State. If the switch sees a redundant path it will put the port with the highest Path Cost into Blocking mode where it will discard packets coming in on that port. In the example below, A2 is a redundant port with port A1, therefore A1 is forwarding and A2 is discarding. When operating in a VLAN with legacy STP devices, use Auto Edge = Disabled for Bridge Ports.



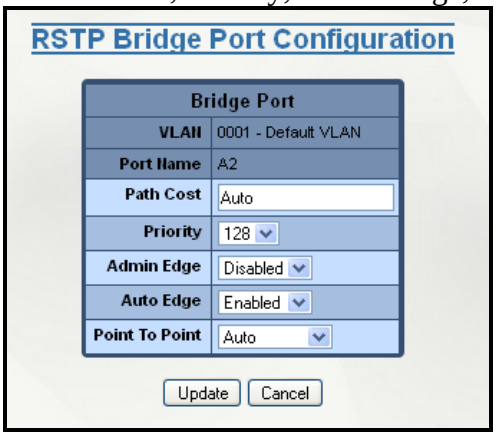
Bridge Ports

Port No	Port Name	Port State	STP BPDU	Path Cost	Priority	Admin Edge	Auto Edge	Point To Point	Designated Bridge Identifier		Designated Port
									Priority	MAC	
01	A1	Forwarding	No	20000	128	Disabled	Enabled	Auto	32768	00:07:af:7d:95:20	1
02	A2	Discarding	No	20000	128	Disabled	Enabled	Auto	32768	00:07:af:7d:95:20	1
03	A3	Disabled	No	20000	128	Disabled	Enabled	Auto	0	00:00:00:00:00:00	0
04	A4	Forwarding	No	20000	128	Disabled	Enabled	Auto	32768	00:07:af:7d:95:20	4
05	A5	Disabled	No	20000	128	Disabled	Enabled	Auto	0	00:00:00:00:00:00	0
06	A6	Disabled	No	20000	128	Disabled	Enabled	Auto	0	00:00:00:00:00:00	0
07	A7	Disabled	No	20000	128	Disabled	Enabled	Auto	0	00:00:00:00:00:00	0
08	A8	Disabled	No	20000	128	Disabled	Enabled	Auto	0	00:00:00:00:00:00	0
09	B1	Disabled	No	20000	128	Disabled	Enabled	Auto	0	00:00:00:00:00:00	0
10	B2	Disabled	No	20000	128	Disabled	Enabled	Auto	0	00:00:00:00:00:00	0
11	B3	Disabled	No	20000	128	Disabled	Enabled	Auto	0	00:00:00:00:00:00	0
12	B4	Disabled	No	20000	128	Disabled	Enabled	Auto	0	00:00:00:00:00:00	0
13	B5	Disabled	No	20000	128	Disabled	Enabled	Auto	0	00:00:00:00:00:00	0
14	B6	Disabled	No	20000	128	Disabled	Enabled	Auto	0	00:00:00:00:00:00	0
15	B7	Disabled	No	20000	128	Disabled	Enabled	Auto	0	00:00:00:00:00:00	0
16	B8	Disabled	No	20000	128	Disabled	Enabled	Auto	0	00:00:00:00:00:00	0
17	C1	No STP	No	20000	128	Disabled	Enabled	Auto	0	00:00:00:00:00:00	0
18	C2	Disabled	No	20000	128	Disabled	Enabled	Auto	0	00:00:00:00:00:00	0
19	C3	Disabled	No	20000	128	Disabled	Enabled	Auto	0	00:00:00:00:00:00	0
20	C4	Disabled	No	20000	128	Disabled	Enabled	Auto	0	00:00:00:00:00:00	0
21	C5	Disabled	No	20000	128	Disabled	Enabled	Auto	0	00:00:00:00:00:00	0
22	C6	Disabled	No	20000	128	Disabled	Enabled	Auto	0	00:00:00:00:00:00	0
23	C7	Disabled	No	20000	128	Disabled	Enabled	Auto	0	00:00:00:00:00:00	0
24	C8	No STP	No	20000	128	Disabled	Enabled	Auto	0	00:00:00:00:00:00	0

RSTP – Ports, Continued …

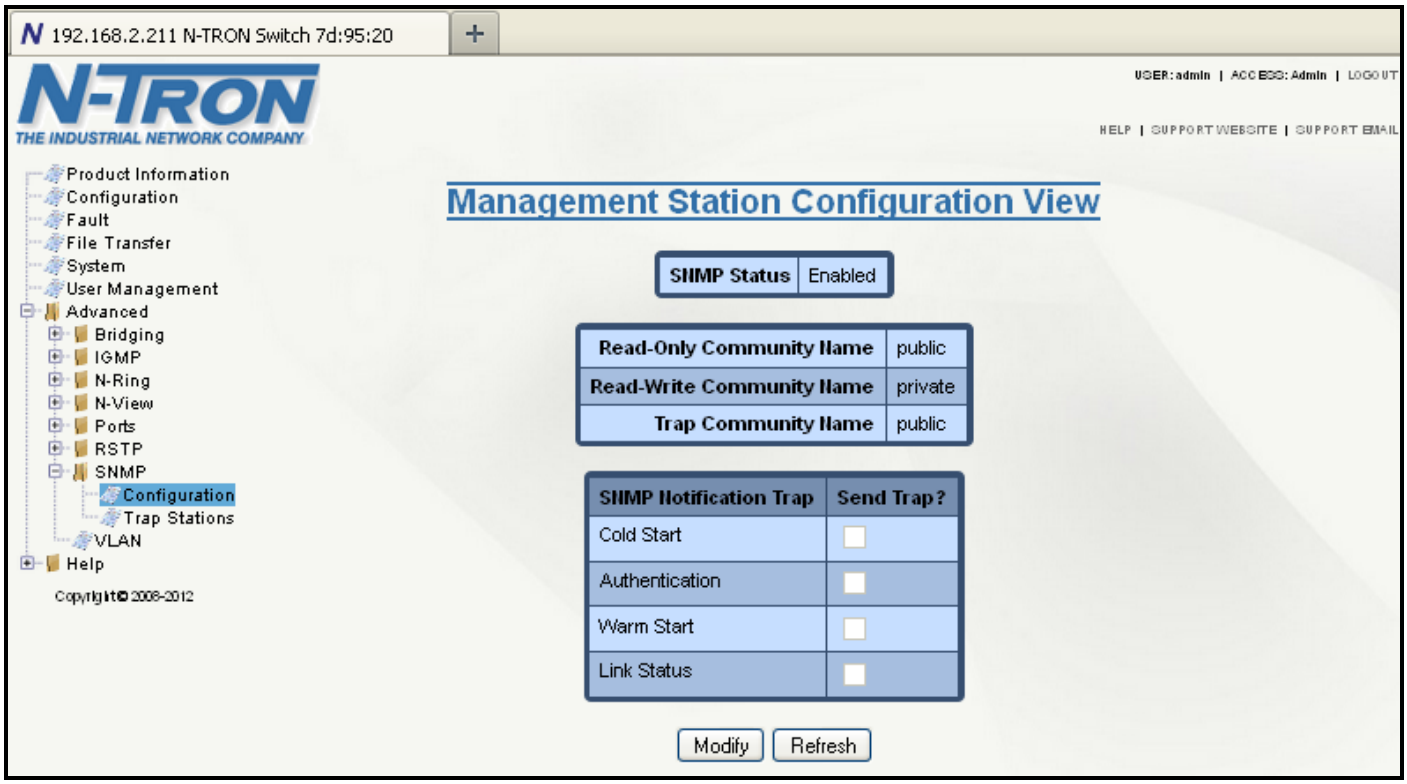
VLAN:	The VLAN that the port is a member of and which is selected as the Bridge's VLAN.
Port No:	The number of the port.
Port Name:	The descriptive name of the port.
Port State:	The **current** RSTP status of the port. This may be Disabled, Listening, Learning, or Forwarding.
STP BPDU:	Whether or not a legacy STP BPDU has been **received** on the port.
Path Cost;	The **current** path cost of the port.The range is 0-200000000. If configured to 0 or Auto, the path cost will be calculated automatically using the actual speed of the port; otherwise the configured value will be used. The default is Auto.
Priority:	The priority of the port.The range is 0-255. The default is 128.
Admin Edge;	Whether or not this port is treated as an Edge Port and can immediately enter the Forwarding state. If Enabled, no BPDUs are expected to be received at the port. Enable only when an end device is linked to this port. The default is Disabled.
Auto Edge:	Whether or not to use a short timeout when waiting for BPDUs before determining that this is an Edge Port (if no BPDUs are received). It may have to be disabled for a very large network. The default is Enabled.
Point To Point:	Whether **at most one other** network port is attached to the port's LAN segment. The port may transition to Forwarding very quickly on a point-to-point MAC link. Values may be Auto (full-duplex links are assumed to be point-to-point, half duplex are not), and Force True or Force False (if the automatic determination would be wrong). The default is Auto.
Designated Bridge Identifier Priority:	The Priority of the Designated Bridge associated with the port's LAN segment.
Designated Bridge Identifier MAC:	The unique MAC of the Designated Bridge associated with the port's LAN segment.
Designated Port:	The Designated Port of the Designated Bridge.The Designated Port provides the lowest cost path from the Bridge port's LAN segment, through the Designated Bridge, to the Root Bridge.

By clicking on the hyperlink for the Port Number on the screen above, one can then get a screen from which to modify the Bridge Port parameters: Path Cost, Priority, Admin Edge, Auto Edge, and Point to Point:



SNMP - Configuration

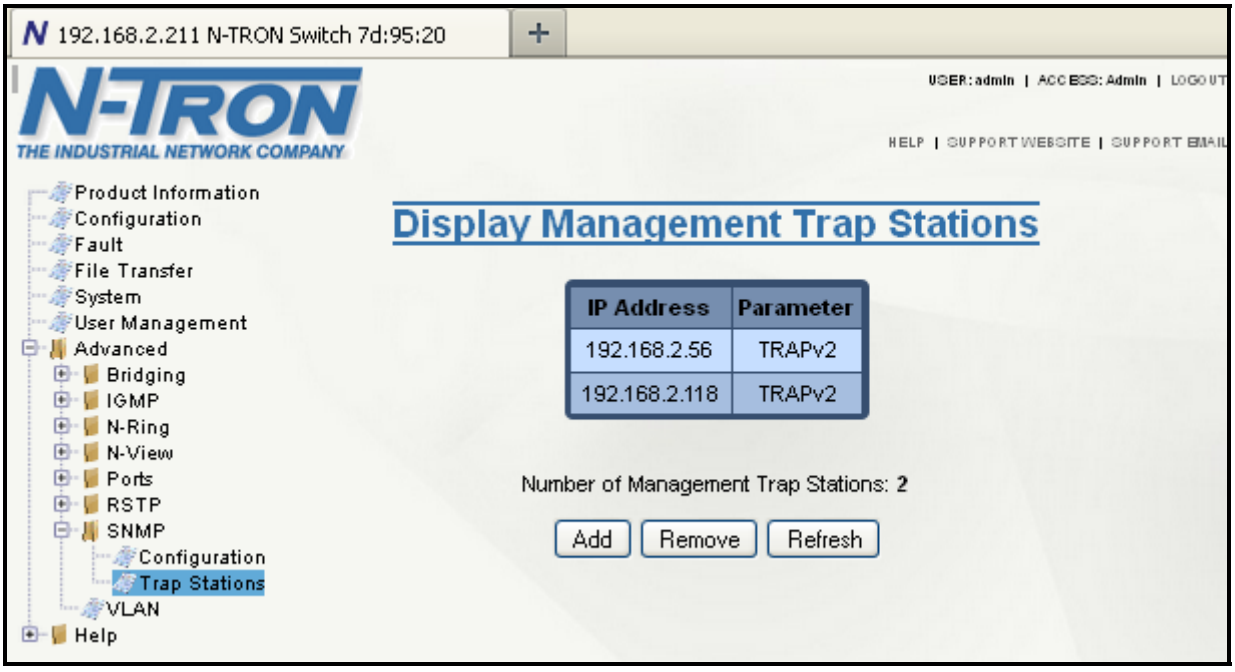
The SNMP configuration tab allows SNMP to be disabled or enabled. The Read-Only, Read-Write, and Trap Community Names are also shown here.



SNMP Mode:	Indicates whether SNMP is enabled or disabled.
Read-Only Community Name:	This configurable field represents the Authorized Community Name for SNMP Get requests. Only alphanumeric characters are allowed. The default is "public".
Read-Write Community Name:	This configurable field represents the Authorized Community Name for SNMP Set requests. Only alphanumeric characters are allowed. The default is "private".
Trap Community Name;	This configurable field represents the Authorized Community Name for SNMP Traps. Only alphanumeric characters are allowed. The default is "public".
SNMP Notification Traps:	This allows for control of which SNMP traps will be sent by this switch. Each of the 4 available traps: Cold Start, Authentication, Warm Start and Link Status can be enabled or disabled individually.

SNMP – Trap Stations

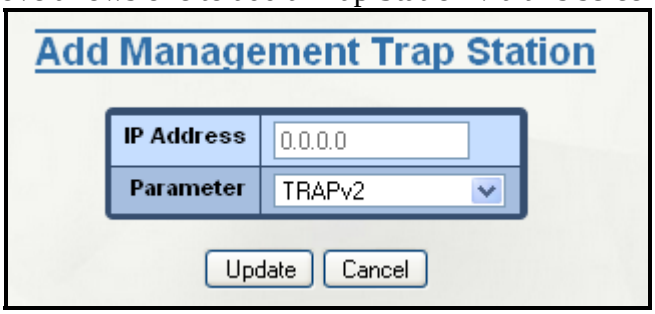
Configuration of the SNMP Ttap Stations is done via this page:



IP Address: This field represents the IP Address of the Management Station to be sent SNMP Traps.

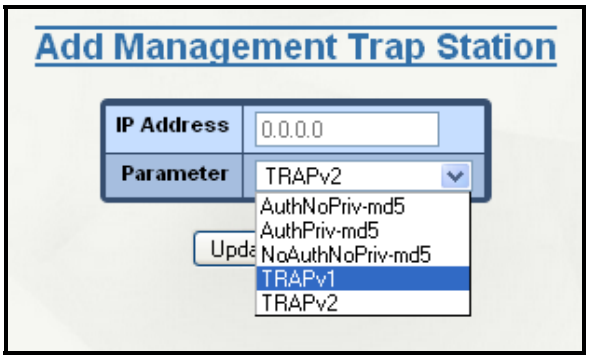
Parameter: This field represents the Target Parameter entry(TRAPv1, TRAPv2, etc) to be used for sending traps to the Management Station.

Pressing the 'Add' button above allows one to add a Trap Station via this screen:



SNMP – Trap Stations, Continued …

The Target Parameter pulldown allows these choices:



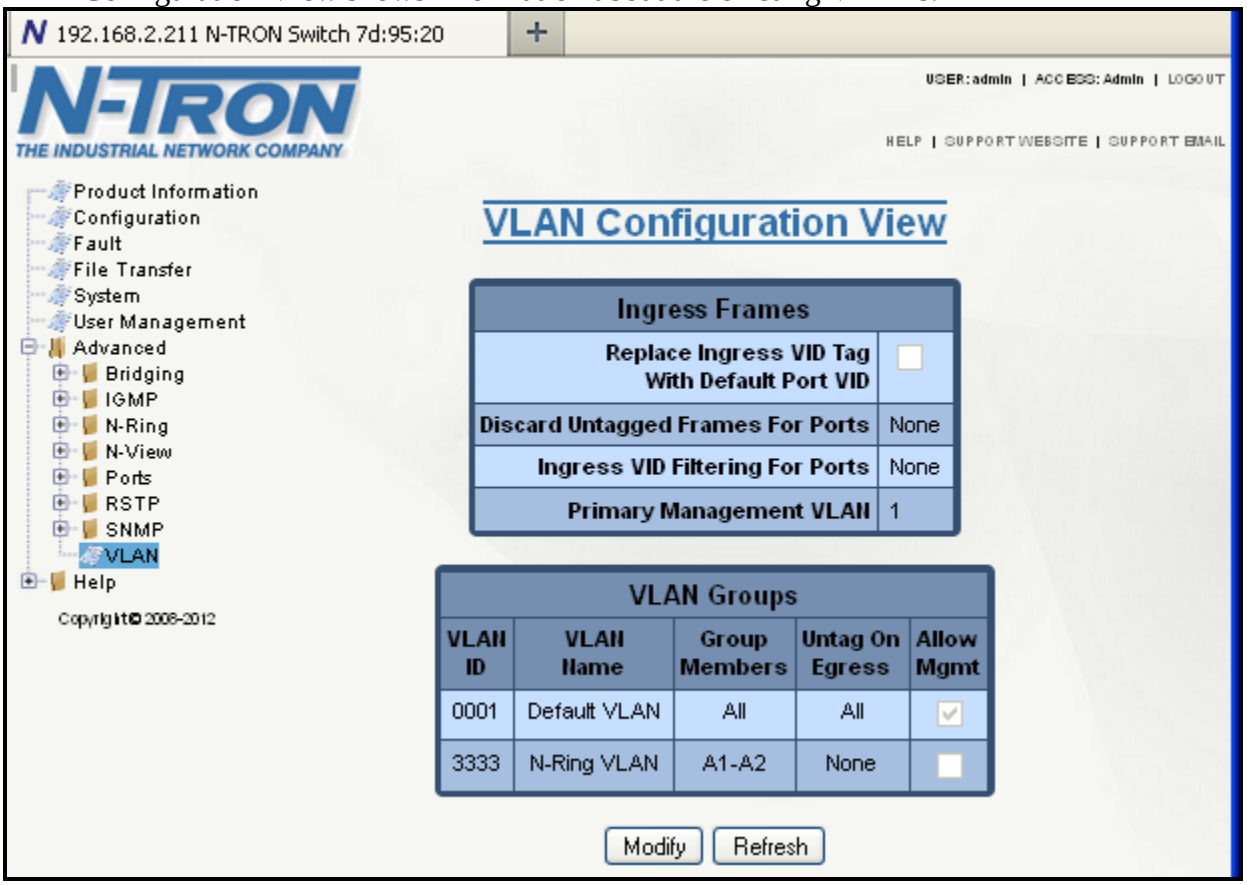
SNMP V3 Default Security Parameters

:The SNMP V3 default user parameters are shown here for reference only, as they are necessary for connecting to the switch securely using an SNMP V3 client when in defaults. The default user and other users can be added, deleted or modified by an administrator via an SNMP V3 client and the values below may be invalid if they are changed by an SNMP administrator.

Username:	initial
Privacy Password:	privpass
Authentication Password:	authpass
Authentication Protocol:	MD5

VLAN

The VLAN Configuration View shows information about the existing VLANs:



Ingress Frames

Replace Ingress VID Tag With Default Port VID:	Specifies whether or not to replace the VID tag of ingress frames with the port's default VID (PVID).
Discard Untagged Frames For Ports:	Specifies whether or not untagged ingress frames are dropped by the selected ports.
Ingress VID Filtering for Ports:	Specifies whether or not to filter out ingress frames when a VID violation is detected on the selected ports.
Primary Management VLAN:	The default egress VLAN used for communications initiated by the switch i.e. DCHP requests.

VLAN, Continued …

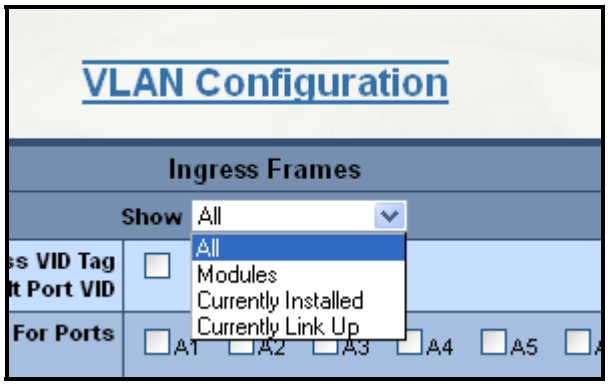
VLAN Group:

VLAN ID:	This field displays the VLAN ID. The range should be 1-4094.
VLAN Name:	This configurable field displays the name of the VLAN, which accepts alphanumeric and only these special characters '#', '_', '-', and '.'.
Allow Management:	Specifies whether or not all ports in this VLAN are management ports.
Change PVID of Member Ports:	Specifies whether or not to set the PVID of the member ports to this VLAN ID.
Remove Ports From Default VLAN When Added To This VLAN:	Specifies whether or not to remove ports from the Default VLAN when they are *added* to this VLAN.

VLAN Group Members

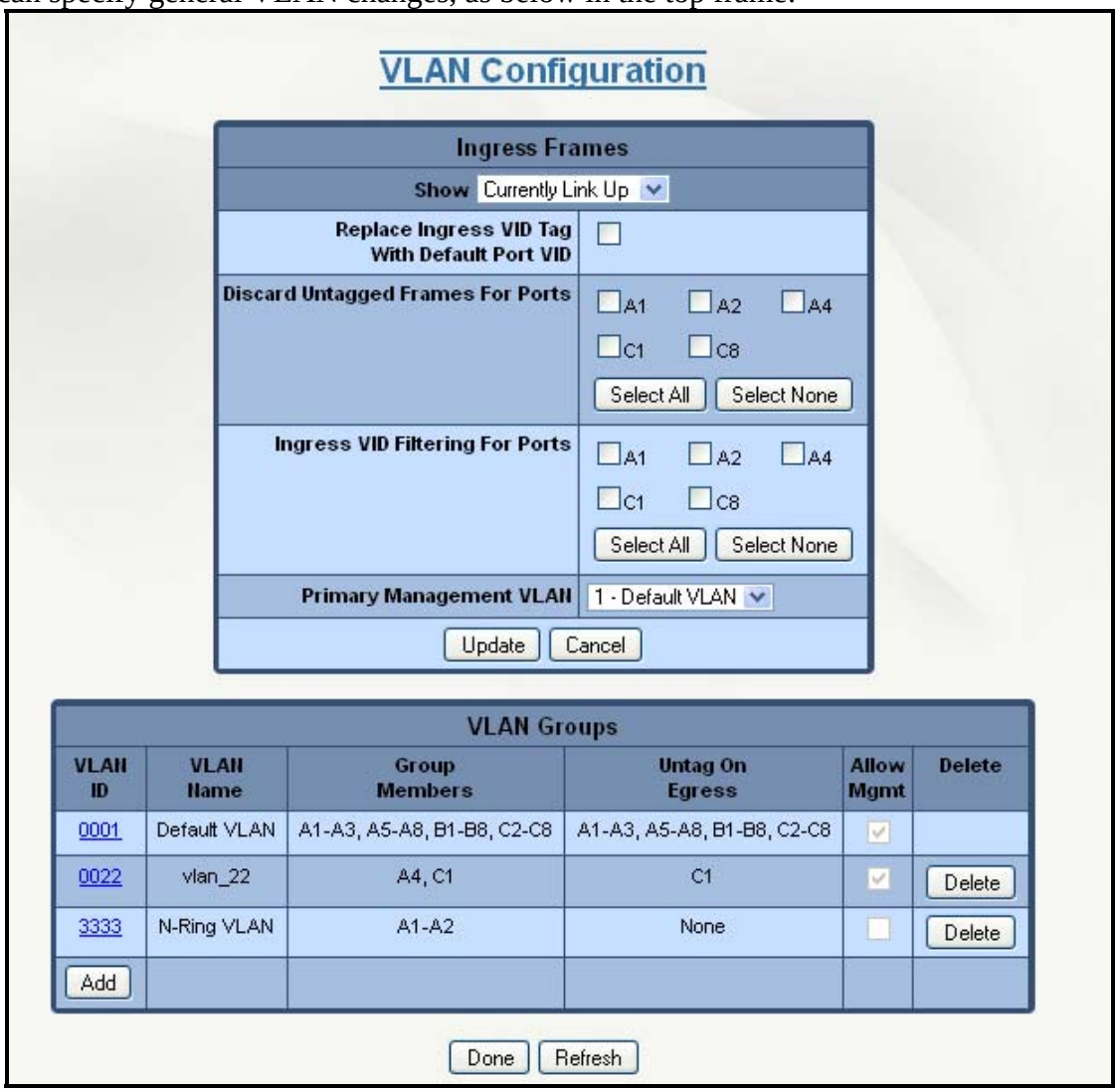
Port No:	The number of the port.
Port Name:	The descriptive name of the port.
Group Member:	Specifies whether or not the port is a member of the VLAN group.
Untag on Egress	Specifies whether or not egress frames are tagged by the port.

Pressing the 'Modify' button on the screen above, you can first decide to view ports that are possible to install (Modules), currently installed, or currently linked up.



VLAN, Continued …

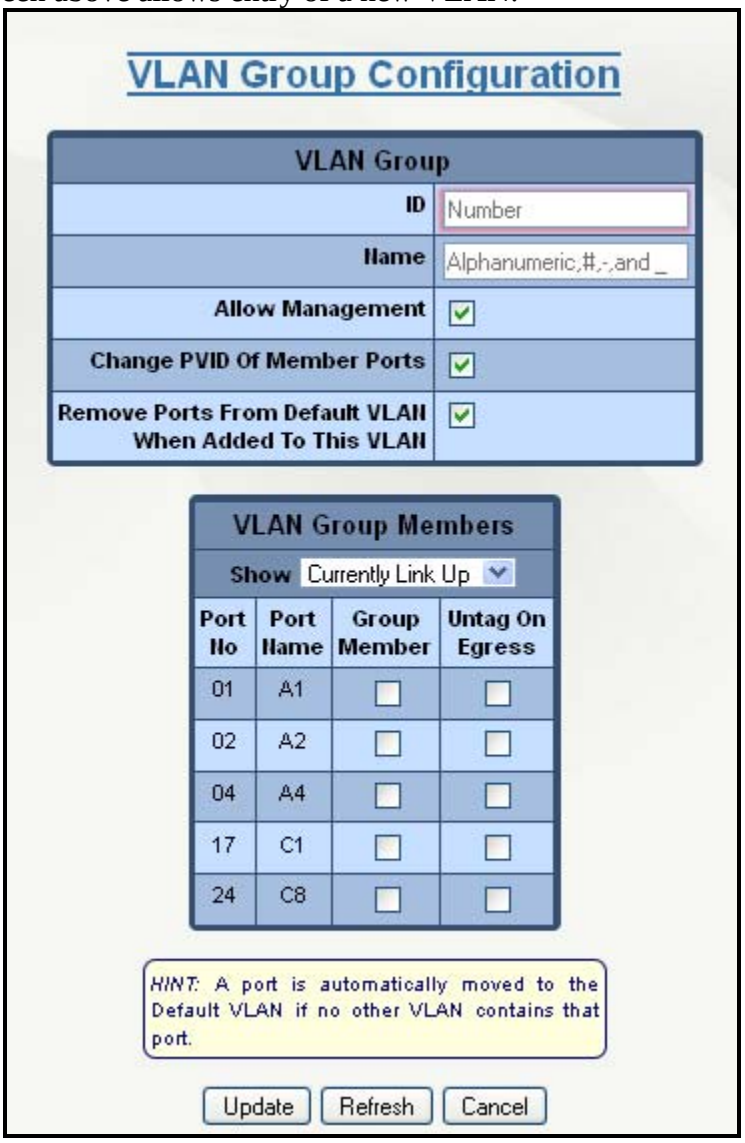
Then you can specify general VLAN changes, as below in the top frame:



Pressing ‘Delete’ in the lower frame of the screen above removes that VLAN.

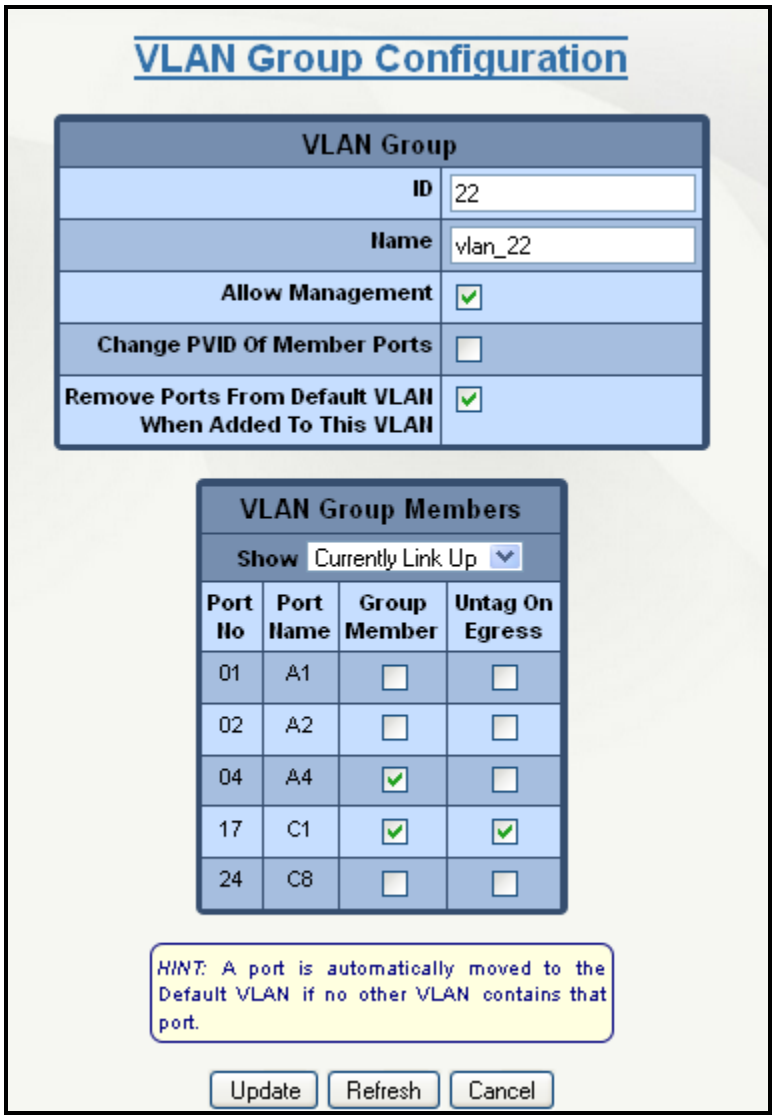
VLAN, Continued …

Pressing ‘Add’ on the screen above allows entry of a new VLAN:



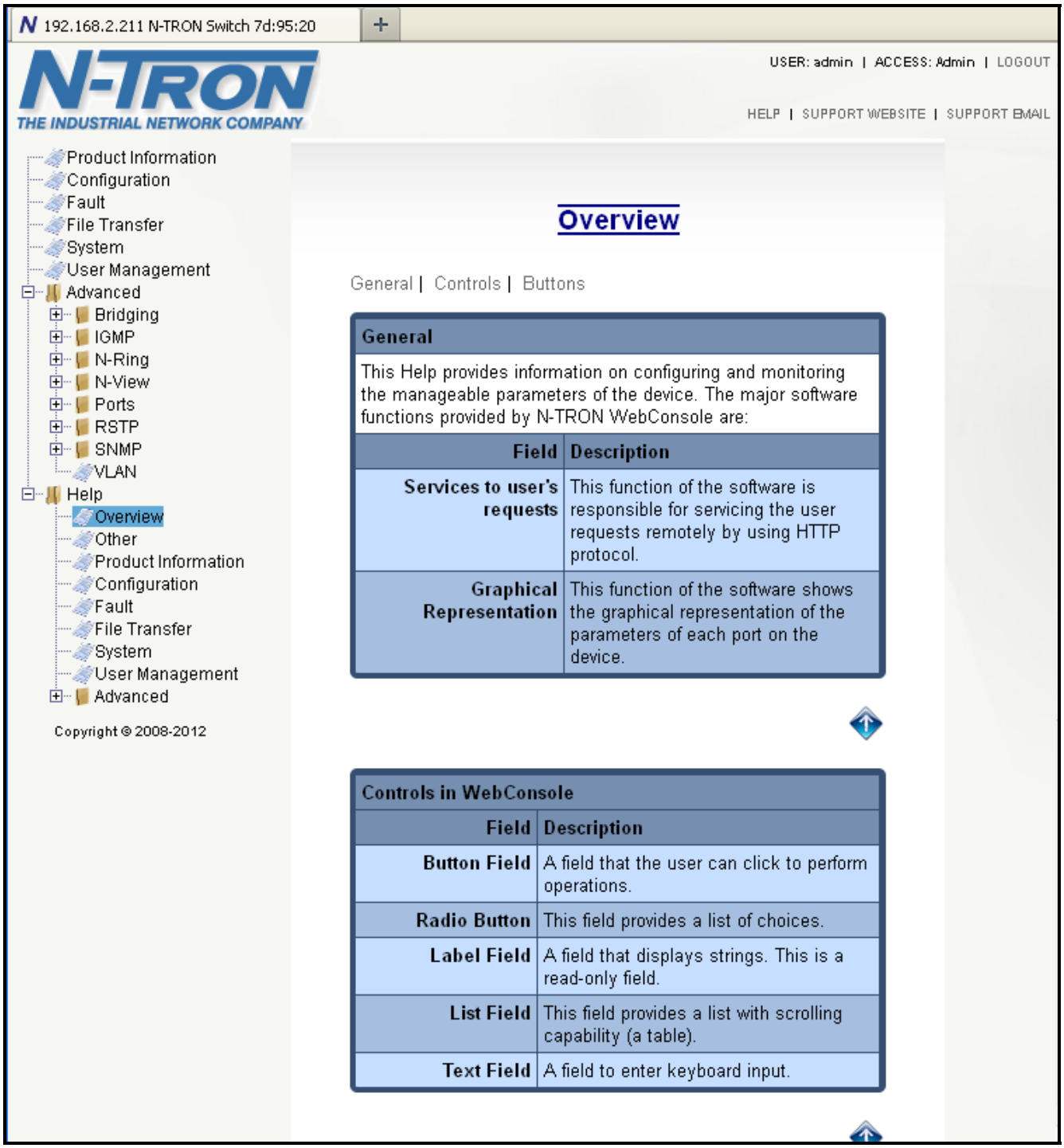
VLAN, Continued …

Selecting the Port Number hyperlink in the lower frame of the screen two above allows changes to that VLAN:

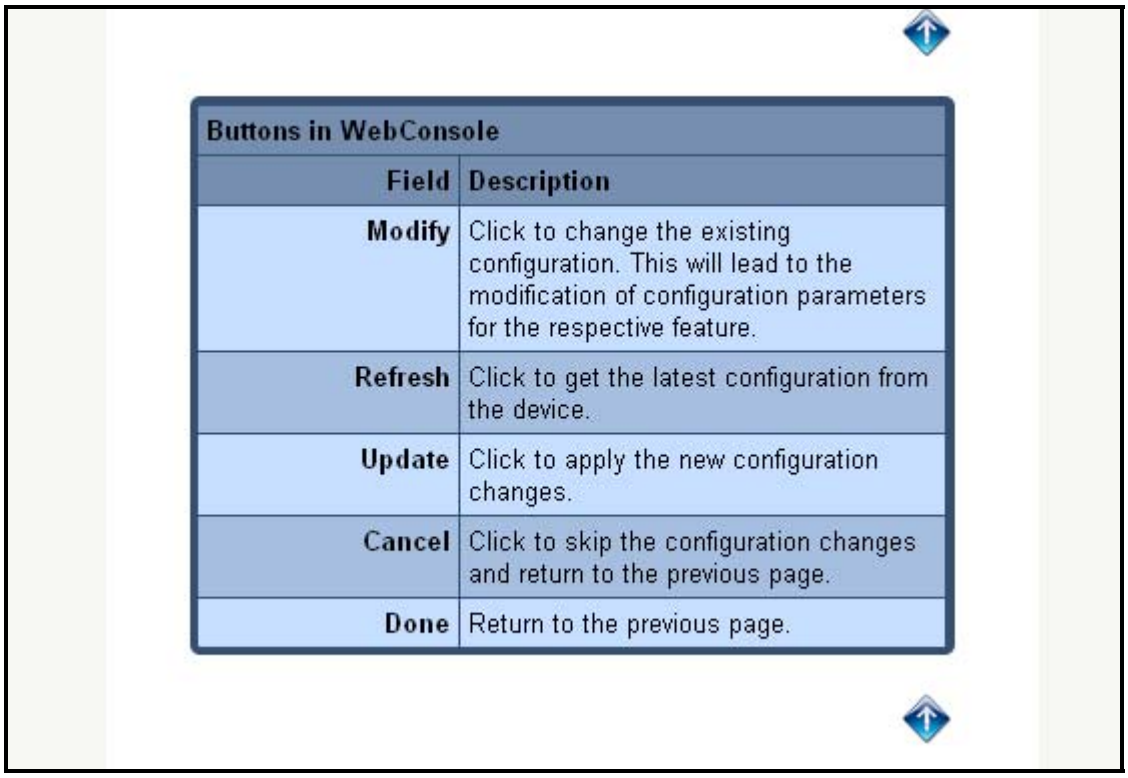


Help – Overview

When the Overview tab of the Help menu is clicked on, you will see the Overview page that will have some basic definitions and more specific choices at the top of the screen.



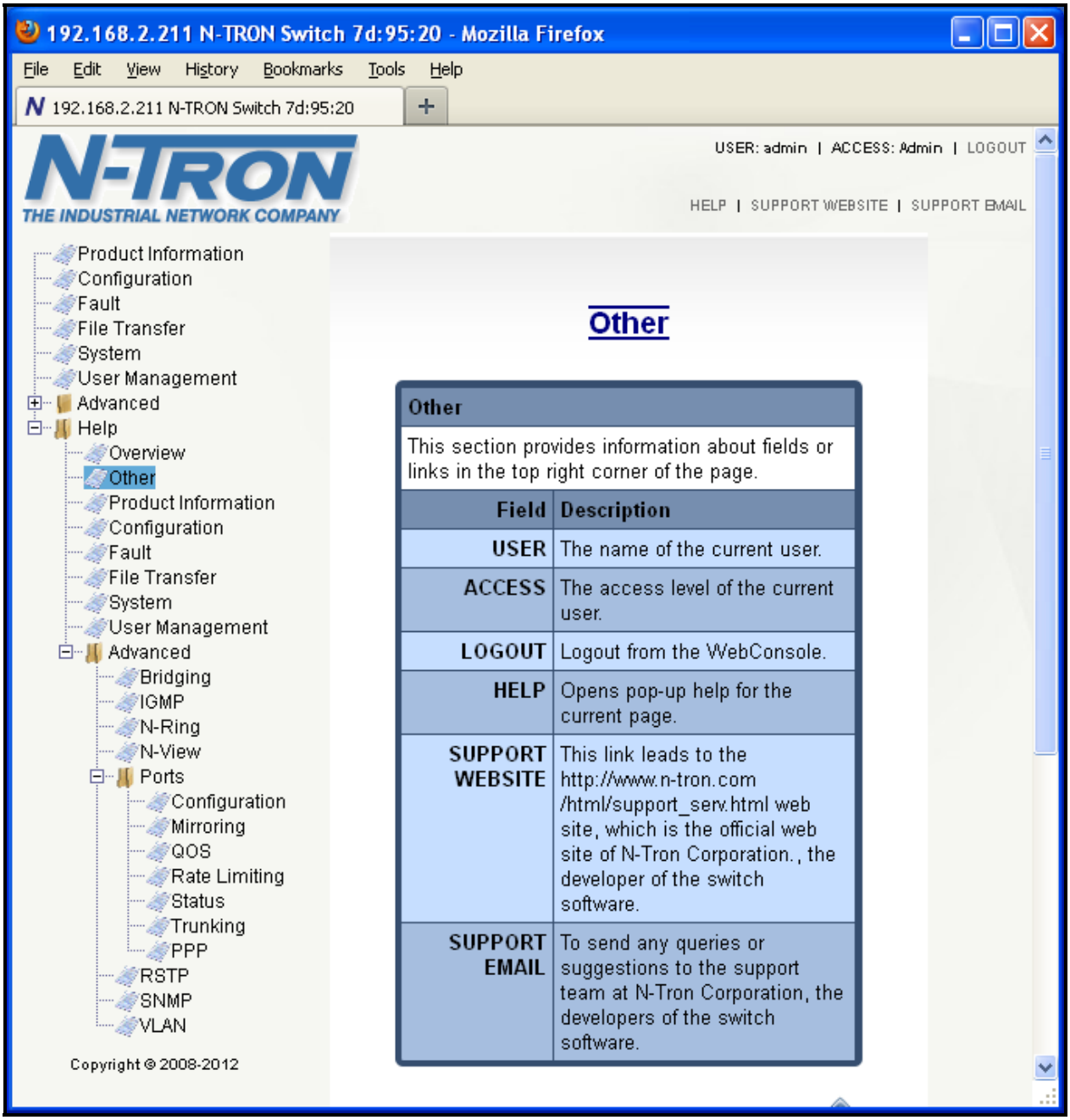
Help – Overview, Continued



Buttons in WebConsole	
Field	**Description**
Modify	Click to change the existing configuration. This will lead to the modification of configuration parameters for the respective feature.
Refresh	Click to get the latest configuration from the device.
Update	Click to apply the new configuration changes.
Cancel	Click to skip the configuration changes and return to the previous page.
Done	Return to the previous page.

Help – Other

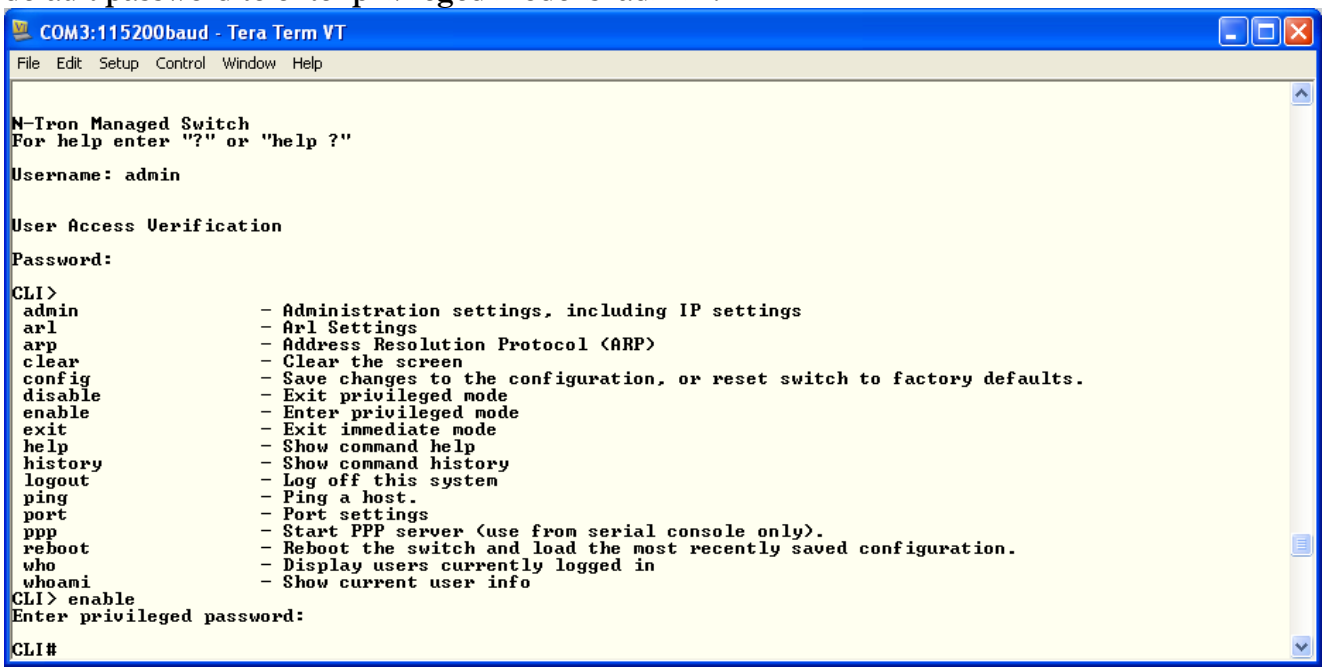
This section provides information about fields or links in the top right corner of the page.



Specific help can be had using the left hand navigation as shown above, or by asking for help in context on any given browser page.

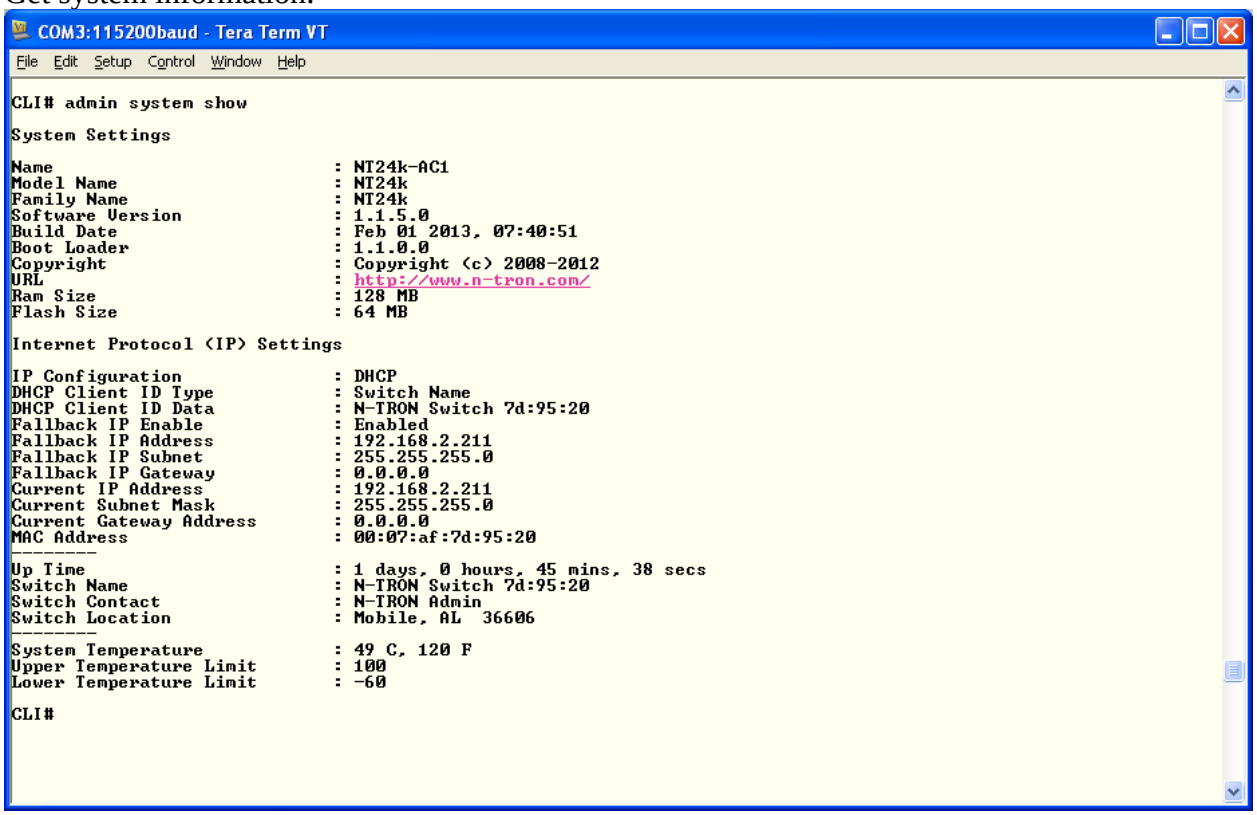
CLI Commands

The CLI contains some status and configuration capability. The default user password is 'admin'. The default password to enter privileged mode is 'admin'.



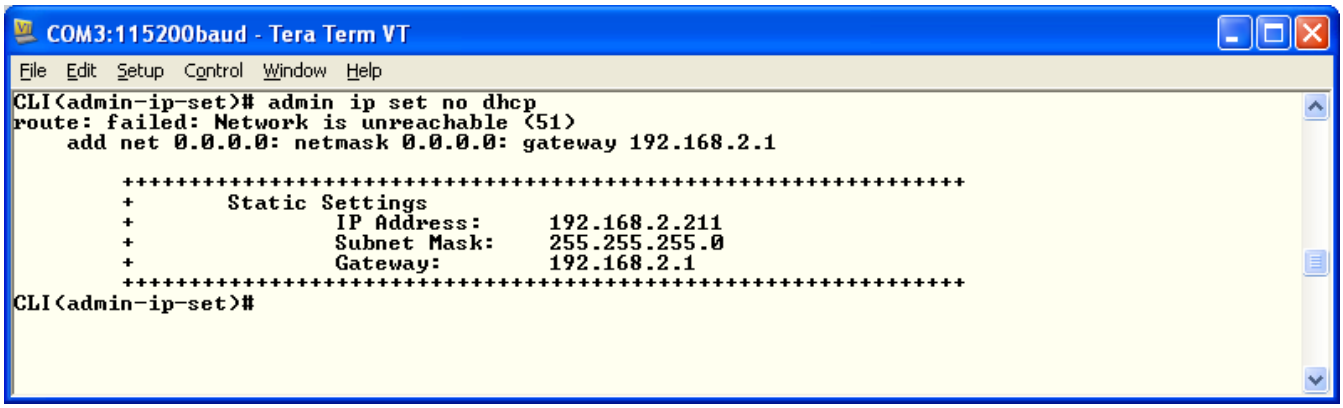
Each command includes help and syntax examples. Below are a few common CLI examples:

Get system information:

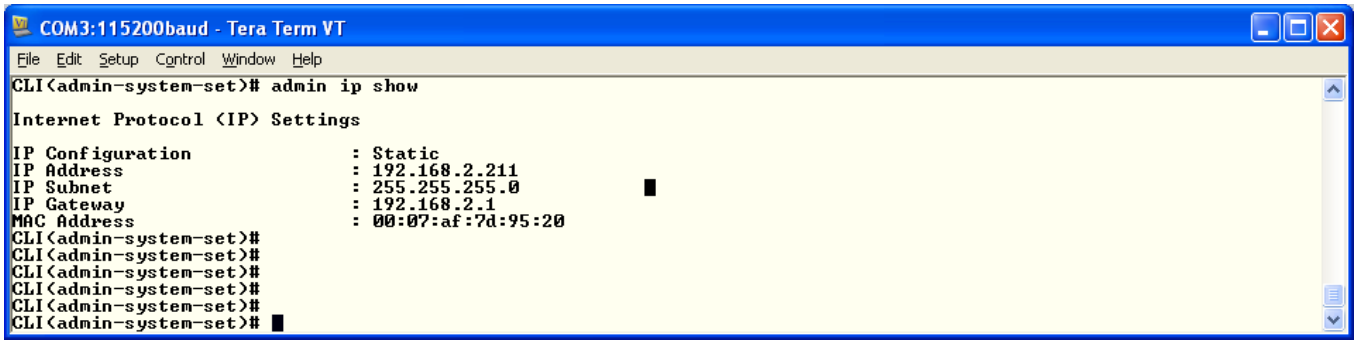


CLI Commands, Continued, …

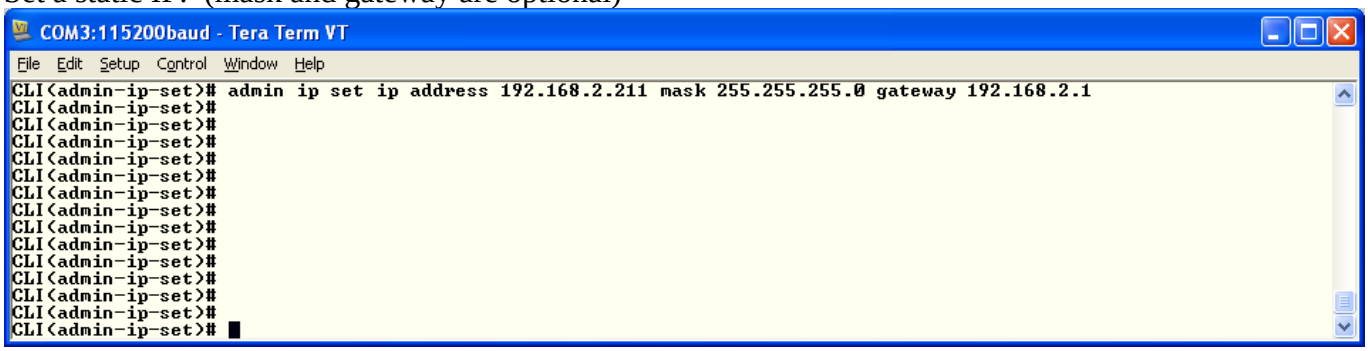
Set IP Mode to ‘static’::



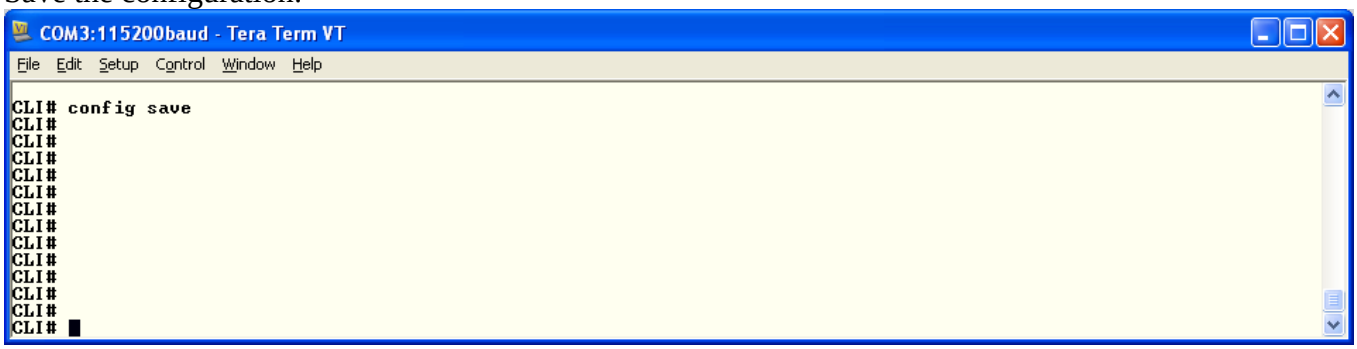
Show the static IP:



Set a static IP: (mask and gateway are optional)

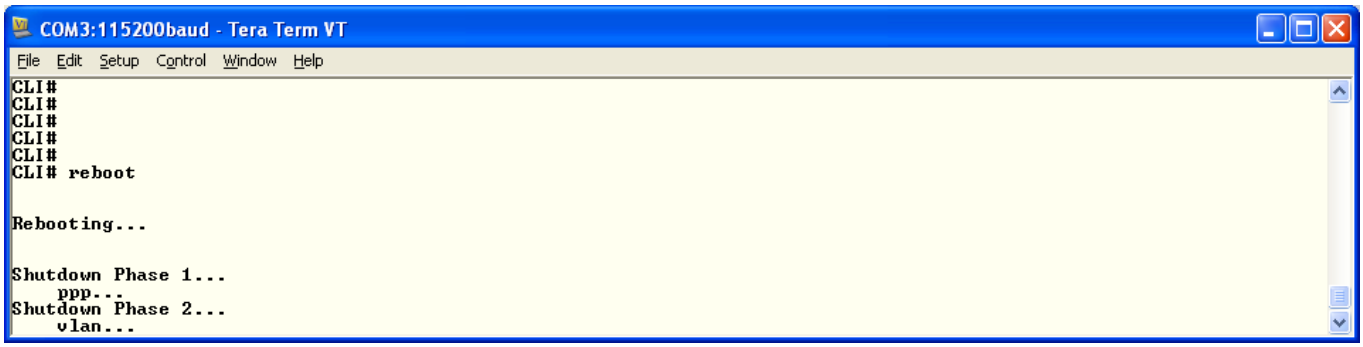


Save the configuration:



CLI Commands, Continued…

Reboot:



Appendix A – XML Configuration File – Factory Defaults

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      <RouterMode>Auto</RouterMode>
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  </IgmpGroup>
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    </MirrorConfig>
  </MirrorGroup>
  <NringGroup>
    <NringConfig>
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      <KeepAliveSeconds>31</KeepAliveSeconds>
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